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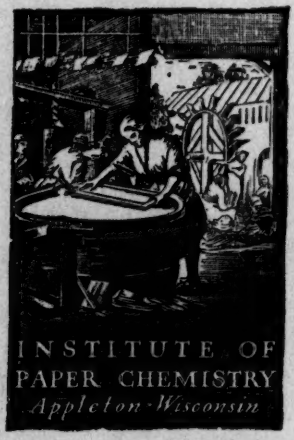
BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

LIBRARY NOTES

MARCH · 1951

Volume 21 Number 7

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Periodicals, Books, and Pamphlets Added to the Library During February

PERIODICALS—BACK VOLUMES

Bulletin of the Imperial Institute. v. 1-35, 1903-37.

BOOKS AND PAMPHLETS

BOOKBINDING

U. S. GOVERNMENT PRINTING OFFICE. Theory and practice of bookbinding. Apprentice training series. Orientation period. Washington [U. S. Govt. Print. Off.] 1950. 246 p.

BUILDING MATERIALS

LEE, JAMES A. Materials of construction for chemical process industries. New York, McGraw-Hill Book Co., 1950. 468 p.

CHEMISTRY, ORGANIC

BEILSTEIN, FRIEDRICH KONRAD. Beilsteins Handbuch der organischen Chemie. 4. Auflage. Zweites Ergänzungswerk, die Literatur von 1920-1929 umfassend, herausgegeben und bearbeitet von Friedrich Richter. Berlin, etc., Springer-Verlag, 1950. 13. Band. 668 p.

FORESTS AND FORESTRY

CUNNINGHAM, R. N., and FOREST SURVEY STAFF, *Lake States Forest Experiment Station.* Forest resources of the Lake States region. U. S. Dept. of Agriculture. Forest resource report no. 1. Washington, U. S. Govt. Print. Off., 1950. 57 p.

GRASSES

HITCHCOCK, A. S. Manual of the grasses of the United States. 2d ed., rev. by Agnes Chase. U. S. Dept. of Agriculture. Miscellaneous publication no. 200. Washington, U. S. Govt. Print. Off., 1950. 1051 p.

LESPEDEZA SERICEA

PIETERS, A. J., HENSON, PAUL R., ADAMS, WILLIAM E., and BARNETT, A. P. Sericea and other perennial lespedezas for forage and soil conservation, by Bureau of Plant Industry, Soils, and Agricultural Engineering and Soil Conservation Service. U. S. Dept. of Agriculture. Circular no. 863. Washington [U. S. Govt. Print. Off.] 1950. 48 p.

MEDICINE

The MERCK manual of diagnosis and therapy; a source of ready reference for the physician. 8th ed. Rahway, N.J., Merck & Co., 1950. 1592 p.

NEWSPRINT

THE ECONOMIST. *Intelligence Unit.* The problem of newsprint and other printing paper, press, film, and radio in the world today. [Publication no. 594 of the United Nations Educational, Scientific and Cultural Organization] Paris, Unesco, 1949. 111 p.

PAPER MAKING AND TRADE

WHEELWRIGHT, WILLIAM BOND. Practical paper technology. Cambridge, Mass., M. J. & W. B. Wheelwright, publishers, 1951. 101 p.

PHASE RULE AND EQUILIBRIUM

RICCI, JOHN A. The phase rule and heterogeneous equilibrium. New York, Van Nostrand [c1951] 505 p.

PYRETHRUM

GNADINGER, C. B. Pyrethrum flowers; supplement to second edition, 1936-1945. Minneapolis, McLaughlin Gormley King Co. [c1945] p. 381-690.

REDUCTONE

EULER, HANS VON, and HASSELQUIST, HANS. Reduktone; ihre chemischen Eigenschaften und biochemischen Wirkungen. Sammlung chemischer und chemisch-technischer Vorträge. Neue Folge Heft 50. Stuttgart, Ferdinand Enke, 1950. 55 p.

STATISTICS

U. S. BUREAU OF THE CENSUS. Statistical abstract of the United States, 1950. 71st ed. Prepared under the supervision of Morris B. Ullman. Washington, U. S. Govt. Print. Off., 1950. 1040 p.

TEXTILE INDUSTRY AND FABRICS

REVIEW of textile progress. Manchester, The Textile Institute, and Bradford, The Society of Dyers and Colourists [1950] v. 1, 1949. 403 p.

TRADE DIRECTORIES

PHILLIPS' paper trade directory of the world, 1951, with which is incorporated "Phillips' directory of paper makers of Great Britain and Ireland" and "Phillips' paper trade directory of the British Empire." London, S. C. Phillips & Co., c1951. 725 p.

U. S. BUREAU OF MINES—PUBLICATIONS

STRATTON, HAZEL J., and WINSLOW, MABEL E. List of publica-

tions of the Bureau of Mines, July 1, 1910—January 1, 1949, with subject and author index. Washington, U. S. Govt. Print. Off., 1950. 460 p.

WALL-PAPER

RULLMANN, FRANZ. Die Tapete; Geschichte, Herstellung, Handel. Ein Lehrbuch über die kulturgeschichtliche, technische, künstlerische und wirtschaftliche Entwicklung der Tapete bis zur Neuzeit mit zahlreichen Abbildungen und vielen Tapetenproben. 2. neubearb. Aufl. Stuttgart, Verlagsanstalt Alexander Koch, 1950. 96 p. + samples.

WISCONSIN—REGISTERS

The WISCONSIN blue book, 1950 [Wisconsin State Centennial 2d ed.] comp. by the Wisconsin Legislative Reference Library. [Madison] State of Wisconsin, 1950. 791 p.

WOOD

FOREST PRODUCTS RESEARCH SOCIETY. Proceedings of the national annual meeting . . . Multnomah Hotel, Portland, Oregon, Monday, Tuesday, Wednesday and Thursday, June 26, 27, 28 and 29, 1950. Madison, The Society [c1950] 506 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ADHESIVES

SCHIRMANN, ADOLFHANNS. Everything can be pasted . . . however, no universal adhesive exists. Allg. Papier-Rundschau no. 1: 14 (Jan. 12, 1951). [In German]

The author, a German adhesive expert, discusses adhesives for oiled and waxed papers and cellulose and aluminum foils. Satisfactory adhesives in a moist condition may not always continue to adhere when the articles are dry. Many different types of cellulose films and aluminum foils exist, and certain adhesives which give good results in one case may not prove satisfactory with different brands. So-called universal adhesives are usually the first ones to fail in difficult cases. In sending inquiries about different materials to be pasted, it is highly desirable that a sufficient supply of samples and detailed information about use requirements be included. The fact that firm adhesion takes place is not the only important point; the manner in which it takes place is equally significant (whether the bond is opaque, transparent, hard, soft, flexible, oil and acid resistant, water soluble, ice and heat resistant, free of alkalies, odorless, etc.). E.S.

AERONAUTICS IN FORESTRY

SCHROEDER, G. H. Helicopter seeding speeds reforestation. Paper Ind. 32, no. 11: 1175-7 (February, 1951).

Reference is made to the Douglas-fir helicopter seeding operations carried out by Crown Zellerbach and their experience to date. Aerial seeding, although not applicable under all conditions, is rapidly developing into a useful tool for restoring favorable sites to production, particularly in inaccessible areas where planting is out of the question. The factors which require consideration are the topography and soil condition of sites, rodent control, and weather conditions; the source of seed is of utmost importance, and every effort should be made to secure seed from a climate and soil comparable to those where it is to be sown. The use of helicopters has certain advantages over that of fixed-wing aircraft, such as operation at lower speed and more even dissemination of seed. 3 illustrations. E.S.

ASSOCIATIONS

ZIMMERMAN, W. B. Association services in mobilization. Paper Trade J. 132, no. 8: 94-5 (Feb. 23, 1951).

In an address before the Writing Paper Manufacturers Association, the various ways in which the Association can serve its members in a time of mobilization are pointed out. M.W.

BACTERIOLOGY

[SHEMA, BERNARD F.] Microbiological survey of the pulp and paper industry. New York, American Paper and Pulp Association, Biological Control Committee, 1950. 12 p.

An investigation of the bacteriological level of the paper industry was carried out by The Institute of Paper Chemistry. Thirty-seven mills, which were representative of the industry in the type of paper made and geographical location, actively participated. These mills submitted 4076 different paper samples, which represented over 49 different grades of paper, for microbiological analysis. The samples were analyzed for their total bacterial count, the number of bacteria on the surface of the sheet, and for the presence of coliform bacteria. The data clearly show that coliform bacteria were absent in all samples received, regardless of their bacterial count or the type of pulp used in making the paper. The data also show that 72% of the paper samples analyzed had a bacterial count of less than 250 bacterial colonies/g. of water, and that 98% of the samples analyzed for surface bacterial count had less than one bacterial colony/sq. cm. The bacterial count varied among mills for the same grade of paper, and paper made from waste paper often had a relatively high bacterial count. However, from the point of view of public health, paper is shown to be an excellent medium for the packaging of foods. 1 table. M.W.

BLEACHING

RATH, H. Changes in cellulose during chlorine bleaching. Melliand Textilber. 31, no. 12: 832-5 (December, 1950). [In German; English, French, and Spanish summaries]

Although the degradation of the cellulose molecule during chlorine bleaching can be prevented to a considerable extent, it is impossible to avoid the oxidation of the alcohol or aldehyde groups, even under the mildest bleaching conditions. The changes in the functional groups are accompanied by certain changes in the properties of the cellulose, particularly as far as its behavior to basic and substantive dyestuffs is concerned. The study of the changes in functional groups provides significant information on the reactions which take place during the oxidative degradation of cellulose, as well as a means for the differentiation between oxycellulose and hydrocellulose. The lowering of the D.P. during bleaching (depending upon the pH of the chlorine bleach liquor) is accompanied by a simultaneous increase in carbonyl groups. Viscose rayon was found to contain principally carboxyl groups and cuprammonium rayon, aldehyde groups, a fact which can be explained by the different manufacturing procedures. 1 table and 5 figures. E.S.

BLEACHING—SULFATE

STONE, W. A., and MATARESE, J. G. Bleaching kraft pulp with mixtures of sodium chlorite and chlorine. Pulp Paper Mag. Can. 52, no. 1: 85-8 (January, 1951); *cf.* B.I.P.C. 17: 613; 19: 227.

The results of bleaching tests in two kraft mills with mixtures of chlorine dioxide and chlorine in the last stages are given. In both cases it was found that higher brightness with excellent strength retention resulted from the application of the mixed gases as compared with ordinary operation. In the stages where the mixed gases were applied, no degradation of the stock took place. 4 tables and 2 references. E.S.

BOARD

BRITISH BITUMEN EMULSIONS, LIMITED. Waterproofing papers and boards. World's Paper Trade Rev. 135, no. 3: 196 (Jan. 18, 1951).

Reference is made to the pitch and bitumen emulsions of the company supplied to paper and board mills in tank cars, wooden barrels, or steel drums

under the trade names Bitusize C.T.P. and Bitusize B. If certain precautions are observed, beater addition does not present any problems. Sieving the emulsion through a 60-mesh sieve just prior to adding it to the beater is a necessary step, because a skin may have formed in the barrels which may not readily redisperse in the beater. In the manufacture of waterproof boards, the pH of the stock should not be less than 7; if soft water is used, lime should be added to harden it. The beater roll should be raised before the addition of the emulsion, and excess beating must be avoided. The final pH should be adjusted to 4.5 by the addition of alum. To reduce foaming troubles to a minimum, all points where air may be entrained should be carefully checked. In general, the addition of a pitch emulsion to the stock reduces its freeness, so that a reduction in the speed of operations may be necessary. Drying should be as gradual as possible, and a wet doctor or wax-emulsion doctor used on the calender; the calender rolls should be heated to approximately 180°F. Calendering is important; the more efficient the process, the greater will be the water resistance of the board. Broke may be repulped in a pulper or by steam digestion; in the ordinary beater, repulping will be somewhat difficult unless live steam is fed to the beater and the temperature kept above 70°C. E.S.

BURNETT, L. K., and KREYLING, R. L. Silicate waterproof adhesive for V-S board. Fibre Containers 36, no. 1: 26, 28 (January, 1951).

This is a brief report of the experiences of The Ohio Boxboard Co. with a silicate-clay adhesive applied to aluminum chloride-coated paperboard to produce solid board of the V-3s type. The paperboard is first coated with a measured quantity of acid aluminum chloride, aged for 24 hours, and combined on a paster with sodium silicate; the aluminum chloride reacts with the alkali of the silicate to produce a relatively neutral, insoluble substance. The problem has been to find the correct formula and a chain of commercially feasible operations; another problem involved the corrosiveness of ordinary aluminum chloride solutions to the metals of the equipment with which it came in contact. Commercial aluminum chloride (32° Bé.) with 0.5% Hibitite, a corrosion inhibitor, caused rapid and serious pitting of the calender rolls. The by-product recovered from a spent catalyst in one of Monsanto's plants with 25-27% anhydrous aluminum chloride was tried and found to be satisfactory from a corrosion standpoint, even after a 10-month storage period. The solution was applied to the board at the calender, and a pickup of approximately 0.345 lb./1000 sq. ft. resulted. The treated board permitted satisfactory operation of the paster, using a silicate-clay adhesive. Some of the samples tested formed a waterproof bond which met the immersion requirements for V-3s board as set down in the Joint Army-Navy specification JAN-P-108. It is believed that more uniform bonding results will be obtained when the calender coating is applied at a higher concentration (resulting in a pickup of 0.5 lb./1000 sq. ft.) with two calender boxes on each side of the sheet. Duplicate and extended runs by other mills should provide the required independent confirmation of the reported results. 1 table, 2 figures, and 2 references. E.S.

EIPPER, D. W. Fibreboards—their manufacture and uses. Pulp Paper Mag. Can. 52, no. 1: 80-1 (January, 1951).

Following a brief historical outline of the development of board manufacture, the author describes the operations in the Gatineau mill of International Fibre Board, Limited, a subsidiary of the Canadian International Paper Co., where Ten/Test fiberboard is made for conversion into wall panels, asphalt-coated sheathing, roof insulation, decorative ceiling tiles, acoustical blocks, and the like. The furnish consists of 10% news mill

rejects, 45% jack pine groundwood, and 45% steamed jack pine groundwood. The board is made on a cylinder filter, pressed, and dried in a kiln. E.S.

RISI, J. Some new European boards made from wood waste. Pulp Paper Mag. Can. 52, no. 1: 82-4 (January, 1951); *cf.* B.I.P.C. 20: 471-2.

The author describes first briefly the manufacture of Novopan, Homogenholz N, and Durisol; although the properties of these products show a considerable variation, they are characterized by one common factor: all three processes call for a very high capital investment. Reference is then made to three recent developments of interest to small wood-using industries. These processes do not produce conventional fiberboard of the insulating type, but an entirely new product of much superior quality to be used as furniture panels or for high-grade interior finishing work. The German Lignova process and the Swiss Harder and Lignorite processes, and their costs and applications are outlined. E.S.

BOARD, CORRUGATED

STOBBE. Honeycomb-corrugated board and constructions made therefrom. Allg. Papier-Rundschau no. 2: 49-50 (Jan. 26, 1951). [In German]

Developments in corrugated board, particularly the honeycomb type, for construction and insulating purposes in Germany, Finland and Sweden, and the Forest Products Laboratory in the United States are reviewed. 4 illustrations. E.S.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. *Chicago Section.* Corrugated from A to Z. Tappi 34, no. 1: 79-81A; discussion: 81A (January, 1951); Am. Boxmaker 39, no. 12: 33-5 (December, 1950); Paper Ind. 32, no. 9: 1002, 1004 (December, 1950); Fibre Containers 36, no. 3: 32, 34, 36, 41 (March, 1951).

In a panel meeting devoted to the corrugated-container field, the following papers were presented: S. F. Thune reviewed briefly the basic theory of the starch process for combining corrugated board; Art Sperling discussed preventive maintenance in the box shop; Don Santmyers described the advantages of sodium silicate as an adhesive in corrugated-board manufacturing; and C. J. Zusi dealt with testing and quality. E.S.

BOARD MILLS

BAARS, HANS. South African mill makes suitcase board. Paper Ind. 32, no. 11: 1178-9 (February, 1951); *cf.* B.I.P.C. 21: 383-4.

An illustrated description is given of the new board mill of Trans-African Paper Products (Pty.) Ltd. in Boksburg, Transvaal. 8 illustrations. E.S.

INLAND CONTAINER CORPORATION, *Indianapolis, Ind.* Inland's silver anniversary. Fibre Containers 36, no. 1: 76-7 (January, 1951).

A history of the company since its start in 1925 as Inland Box Company is given. E.S.

BOARD MILLS—WASTE LIQUOR

THE AMERICAN WELL WORKS, *Aurora, Ill.* Fiber recovered

from waste waters pays for treatment plant in 2 years. Chem. Processing 14, no. 2: 10-11 (February, 1951).

State regulations required a Michigan paper company which produces asphalt board to install a waste treatment plant. The plant consists of: (1) a rapid-mix (Homomix) unit where chemicals are mixed with the raw waste, (2) a two-stage propeller-type flocculation unit, and (3) a down-flow circular sedimentation tank (Flocsettler) which is equipped with a sludge-removal mechanism and surface-effluent troughs or launders. Although the original design provided for discharge of the treated effluent to the river, the degree of purification was so high that it was possible to recirculate about 85% of the effluent water into the production processes. In addition, the sludge from the sedimentation tank, after concentration, is returned to the board machines, and almost all fiber is reclaimed. When the value of the reclaimed fiber was estimated, it was found that within about two years the savings would cover the cost of the entire treatment plant. Diagrams of the various treatment processes are included. 5 figures. M.W.

BOARD SPECIALTIES

KING SALES & ENGINEERING, INC., *San Francisco.* Designed to carry anything merchandised in cans. Packaging Parade 19, no. 217: 60-1, 64 (February, 1951); Am. Boxmaker 40, no. 2: 26-7 (February, 1951).

A new carry-home carton, named "View Pack" has been used successfully for packaging canned beer and other products sold in cans, such as juices and soups. The carton holds six cans in a convenient display package. All but a scant margin at the top and bottom of each carrier is visible to the shopper; this is a feature which has sales value and makes the package economical in terms of paperboard consumption and easy, quick refrigeration. The automatic handling operation is described. Patents are pending on both the View Pack carton and its cartoning machine; they will be marketed together. 12 illustrations in the first reference. M.W.

BUYING

BECKETT, WILLIAM. Choosing paper. Modern Lithography 19, no. 2: 38, 95, 97, 99 (February, 1951).

Because paper is an exceedingly complex substance, and its characteristics depend upon very delicate control of many elusive variables at all stages of manufacture, the quality and performance properties of paper made by different papermakers are not standard. It is necessary, therefore, in planning a printed piece to select from a general type of paper which possesses the physical characteristics appropriate to the intended use. Consideration should be limited to paper from sources known to be reliable. It is pointed out that price should not be used as the basis for a final choice. In conclusion, a discussion concerning the current shortage of pulp and rising cost of paper is given. M.W.

CASEIN

WILSON, HARRY D. Casein summary 1950. Paper Trade J. 132, no. 8: 82-3 (Feb. 23, 1951); *cf.* B.I.P.C. 20: 550.

During the early part of 1950 there were plentiful supplies of casein available from the Argentine. Users in the U. S. were anticipating an increase in domestic production, however, and continued to work with minimum inventories. When it became apparent in June that domestic production would

not increase, and the Korean War broke out, a sharp wave of buying began which sent prices of both domestic and Argentine casein soaring. At the present time world consumption of casein is at an all-time high; an estimated 70 million pounds are used annually in the U. S. Production in the U. S. amounted to only 20 million pounds in 1950. Argentina continues to be an indispensable source of supply, and is the most important factor in the casein situation at the present time. It is doubtful if there will be any excess supplies for many months ahead. 4 tables. M.W.

CELLULOSE

HEUSER, EMIL, and JØRGENSEN, LEIF. Chain length and chain-length distribution of wood cellulose as compared with cotton. Tappi 34, no. 2: 57-67 (February, 1951).

The average chain length and chain-length distribution in celluloses as they originally exist in lignified plant materials, such as wood, are still a matter of conjecture. Because no methods of isolating the cellulose component from such plant material without degradation are as yet available, compromises must suffice for the present. A review shows the available methods and accomplishments to date. Attempts to improve the situation concern (1) limited pulping with bisulfite cooking liquors, (2) direct nitration, and (3) treatment with sodium chlorite in acid solution. Whereas the first method produces average D.P.'s for sprucewood cellulose which would seem to approach those as they originally exist in this wood species, neither of the other two methods produces acceptable results for this type of wood. However, when applied to aspenwood, the two methods yield values which would seem to deviate not too far from the original state. The possible reasons for the different behavior of the two types of wood are discussed. Raw cotton, grown under protection against atmospheric influences and taken from an unopened boll shortly before flowering, was chosen as a representative of cotton cellulose as it originally exists in the plant. Its average D.P. was 50 to 60% higher than the values found for the wood species. It is probable that this difference is to a great extent the result of a natural cause. The results of attempts to find the chain-length distribution of the cellulose as it originally exists in lignified plant material are likewise influenced and obscured by the effects of the degradation encountered during isolation. Thus, a certain quantity of the very short chain material, as found in sprucewood cellulose, undoubtedly was not present originally but resulted from degradation during isolation. Likewise, the longest chains, found to be of considerable length in the isolated cellulose, were probably still longer in its original state. In the cotton cellulose, the short chain material is missing, which appears to be the main reason for its greater uniformity as compared with wood cellulose. However, the medium and long chains still display considerable variation in length—that is, a polymolecularity which must be assigned to the cellulose as nature produces it in the cotton plant. 8 tables, 6 figures, and 34 references. E.S.

HUSEMANN, E., and CONSBRUCH, U. Macromolecular compounds. [341] Cellulose. [101] A criticism of the cellulose formula of Pacsu. Makromol. Chem. 5, no. 2: 179-83 (November, 1950). [In German] *cf.* B.I.P.C. 19: 692.

The authors maintain that the end-group method of Pacsu (permanganate oxidation) does not oxidize the terminal glucose groups in the cellulose chain but only impurities which are present. Different samples of glucose, xylose, and disaccharides reacted only slightly with permanganate under Pacsu's prescribed conditions, giving "calculated D.P." values of 40 to 117.

Similarly, raw cotton consumed less permanganate after purification and hydrolytic degradation with potassium permanganate. Whereas the viscosity showed a decrease in D.P. from 2500 to 300, the D.P. calculated from permanganate consumption increased from 250 to 450. The authors conclude that the Pacsu formula for cellulose, derived from data given by permanganate oxidation, is incorrect. 1 figure and 5 references. J.W.G.

MEREDITH, R. Cotton and cellulose—physics. Rev. Textile Progress 1: 7-13 (1949).

The author presents a review of developments in the application of physics to the study of fibrous materials during 1948 and 1949. 35 references. M.W.

NEALE, S. M. Cotton and cellulose—chemistry. Rev. Textile Progress 1: 14-23 (1949); *cf.* B.I.P.C. 20: 353.

Developments in the field of cellulose and cotton chemistry which were reported in the literature from 1947 to 1949 are reviewed under the following headings: structure, adsorption, derivatives, degradation, and analysis. 45 references. M.W.

CELLULOSE—HEMICELLULOSE

YUNDT, ALBERT. Crystalline hemicelluloses. Tappi 34, no. 2: 89-95 (February, 1951).

In the first two parts of this study, the preparation of amorphous and crystalline xylan from barley straw and the preparation of crystalline xylan from paper birch are described. This is believed to be the first report of crystalline xylan, and some of the properties of the crystals and photographs are included. Acid and enzymatic hydrolysis procedures of both amorphous and crystalline xylan are presented in the third part. The unsuccessful attempt to produce crystalline mannan from ivory nut mannan "A" and slash pine mannan is reported in the fourth part of the study. 7 tables, 6 figures, and 22 references. M.W.

CELLULOSE—OXYCELLULOSE

REEVES, RICHARD E., and JUNG, JULIUS R., JR. Stabilization of neutral hypochlorite-oxidized cotton fiber. Textile Research J. 21, no. 1: 22-5 (January, 1951); *cf.* B.I.P.C. 20: 633.

Cotton fiber oxidized by neutral hypochlorite solution, like cotton fiber oxidized by periodate, suffers two types of damage: one type is immediately evident; the other is latent damage, which becomes evident after exposure of the oxidized fiber to aqueous alkali. However, when fiber oxidized by neutral hypochlorite is treated with ethereal diazomethane before exposure to alkali, a portion of the latent damage does not develop. The oxidized and treated fiber displays lower alkali solubility, lower cuprammonium fluidity, and greater strength after exposure to alkali than does the fiber that is oxidized but not treated. Chlorous acid, found to be effective against the latent damage in periodate-oxidized cotton, is not effective against the latent damage in hypochlorite-oxidized cotton. 3 tables, 3 figures, and 5 references. E.S.

CELLULOSE ESTERS

HOWLETT, F., and URQUHART, A. R. The solubility and structure of cellulose acetates. Chemistry & Industry no. 5: 82-7 (Feb. 3, 1951).

The way in which the principal structural features of cellulose esters

determine their solubility properties is discussed. The structure of cellulose esters is similar to that of cellulose in that it consists of minute crystalline regions merging into disordered amorphous regions. In cellulose esters, variations occur in the amount and randomness of esterification, in the proportions of crystalline and amorphous materials, in chain length, and chain-length distribution. The regions where there is no contact between the chains may be considered to be in solution, and the influence of structure on solubility is, therefore, largely to be found in the extent and permanence of the crystalline regions present. The evidence of solvation and the effects of crystallinity, distribution, amount and type of substituents, auxiliary combined groups, covalent cross links, and chain length on the solubility of cellulose acetates are discussed in detail. 43 references. M.W.

CELLULOSE ETHERS

REEVES, RICHARD E., MAZZENO, LAURENCE W., JR., and HOFFPAUIR, CARROLL L. Glycosidic methoxyl groups in methanolyzed cellulose. Textile Research J. 21, no. 2: 78-81 (February, 1951).

Oxidation by a glycol-cleavage reagent has proved that the acid-labile methoxyl groups in methanolyzed cellulose are linked in glycosidic combination (one per molecule), and not in an acetal structure, which would require two such groups per molecule. Evidence confirming the glycosidic structure was obtained by fractionating methanolyzed cellulose to the point where number-average molecular weights must be calculated on the basis of one methoxyl group per molecule. The rate of removal of methoxyl groups from methanolyzed cellulose upon acid hydrolysis was reinvestigated. The rate is roughly comparable to the rate of hydrolysis of methyl glucopyranosides. These findings contradict the basis for a claim, based on copper-number determinations, that the methoxyl groups of methanolyzed cellulose are very rapidly hydrolyzed and are of the acetal type. (*cf.* Mehta and Pacsu, B.I.P.C. 20: 163). 4 tables and 4 references. E.S.

CHEMICAL ENGINEERING—ESTIMATES AND COSTS

CHEMICAL ENGINEERING. How process equipment costs varied. Chem. Eng. 58, no. 2: 158 (February, 1951); *cf.* B.I.P.C. 18: 227.

The annual average Marshall and Stevens indexes of comparative equipment cost for eight process industries (including the pulp and paper industry) and four related industries for the period from 1913 to 1950 are given, the year 1926 representing 100. A comparison of the Marshall and Stevens industry average with the Austin Co.'s index of industrial building costs and the *Engineering News Record* index of heavy construction costs is presented in graphic form. 2 tables and 1 figure. M.W.

CHEMICAL TESTING—LIGNIN

DEBAUN, ROBERT M., and NORD, F. F. A quantitative phloroglucinol-HCl test in the evaluation of lignin preparations. Tappi 34, no. 2: 71-3 (February, 1951).

A quantitative determination of the color produced by lignins in reaction with phloroglucinol-hydrochloric acid solution is described. The color reaction is interpreted in terms of β-hydroxy or α, β-unsaturated aldehydes. Samples tested include native lignins and lignins isolated by Soxhlet extraction, before and after decay by molds, from a typical softwood and several hardwoods. 1 table, 3 figures, and 20 references. E.S.

KRATZL, K., and OSTERBERGER, K. A simple qualitative test for

alkoxyl groups. Monatsh. 81, no. 7: 996-8 (Dec. 15, 1950). [In German]

The alkyl iodide obtained in the Zeisel determination is absorbed in cooled alcohol, treated with thiourea and determined as alkylthiuronium picrate. The melting point of methylthiuronium picrate is 224°C., and that of the ethyl derivative, 188°, which allows a differentiation between methoxyl and ethoxyl groups. The test is of significance in many natural products, such as lignin. 14 references. F.E.B.

CHEMICAL TESTING—PULP—CUPRAMMONIUM VISCOSITY

ZART, A. The determination of the degree of polymerization of cellulose according to Staudinger. Melliand Textilber. 32, no. 1: 39-40 (January, 1951). [In German; English, French, and Spanish summaries]

The previous Fachausschuss der Fachgruppe chemische Herstellung von Fasern has developed standard testing methods for synthetic textile fibers which were published as FaChemFa methods; some of these procedures are being revised by the Prüfungsausschuss der Industriegemeinschaft Chemiefaser and are published under their old designation. The present article gives the text of the 1949 revision of FaChemFa 2 for determining the D.P. of pulps and synthetic cellulose fibers from their viscosity in dilute cuprammonium solutions according to Staudinger, including the preparation of the specimen and the reagents, apparatus, and testing procedure proper. 1 figure and 2 references. E.S.

CHEMICALS

CHEMICAL ENGINEERING. Plants & processes. Chem. Eng. 58, no. 2: 119-29 (February, 1951).

Following a brief report of the expansion program in chemical industries for 1951, the major developments during 1950 in the various chemical fields are presented. In the case of sulfur, new plant and process developments are of interest mainly from the technological and pollution-control points of view, since processes for recovering sulfur cannot turn out more than a small percentage of the ever-increasing demand. The increased demand for caustic and chlorine by petroleum refiners, manufacturers of synthetic detergents, industrial solvents, and organic chemicals, and the pulp and paper industry has resulted in the installation of facilities to produce these chemicals by several companies. More than $120 million was committed during 1950 for various capacity-increasing projects by pulp and paper firms, including International Paper Co., Coosa River, and Columbine Development Co. Projects under way to increase production of various chemicals during 1950 are summarized in a table, and a list of new processes is given. 1 table, 1 figure, and 9 illustrations. M.W.

CHEMICAL ENGINEERING. Supply & demand. Chem. Eng. 58, no. 2: 130-6 (February, 1951).

Business is at the highest level ever reached in peacetime, with no significant letdown in view. Every major chemical-using industry measured by Chemical Engineering's consumption index is operating at a rate well above the record levels of 1948. The recent demand for pulp and paper has raised the use of chemicals in this process industry during 1950 about 17% over 1949. The supply situation of various chemicals is summarized. Production of sulfur lagged behind demand, and pulp operators took the largest share of nonacid sulfur used last year. A reduction in exports of sulfur

will increase the supply temporarily, but a long-range solution will depend on new sources. The demand for caustic soda was increased last year, partly on account of the shortage of soda ash which resulted in the use of caustic by some industries as a temporary expedient. The production of chlorine has continued to increase and in 1950 approached two million tons. About 16% of the total output is used in the pulp and paper industry. Production of soda ash in 1950 was cut sharply by the occurrence of strikes in the industry. A breakdown of the consumption of each chemical is presented in tabular or graphic form. 5 tables and 10 graphs. M.W.

LEWIS, HARRY F. Paper problems have not been neglected. Chem. Eng. News 29, no. 6: 452-5 (Feb. 5, 1951).

The paper industry is the third largest consumer of chemicals, and in terms of tons, dollars, and percentages, the chemical industry has made great progress in producing chemicals for the pulp and paper industry. Some of the many contributions made to papermaking by the chemical industry are described. With regard to the problem of raw materials, DDT has proved very effective in combating insect enemies of wood. A chemical method of bark removal, which serves as a means of rot prevention, has been developed. Ammonium-, magnesium-, and sodium-base sulfite liquors are being used experimentally as substitutes for calcium-base sulfite liquor. Various chemicals are used in the semichemical pulping processes. Sodium chlorite, chlorine dioxide, sodium peroxide, and zinc hydrosulfite are each used in bleaching to produce different characteristics in paper. It is in the field of beater additives that the chemical industry has been particularly active in recent years. Some beater additives and the properties they produce are described. Several chemicals used as effective slime-control agents are mentioned. Other chemicals are used in the finishing process, and still others in the manufacture of paperboard. In addition to the uses for chemicals in every stage of papermaking, mention is made of many chemicals which have specific uses either in the processing or in the final product. 2 illustrations. M.W.

REICH, J. G. Chemical industry and paper manufacture. Allg. Papier-Rundschau no. 2: 51-3 (Jan. 26, 1951). [In German]

Following a condensed translation of the article by Kingerley (*cf.* B.I.P.C. 21: 8-9) by Kotte, the author discusses German chemical products offered by the Badische Anilin- und Soda-Fabrik, Ludwigshafen, to the paper industry for special purposes; standard chemicals, such as rosin, alum, kaolin, etc., are not included. Consideration is given to chemical products for the manufacture of wet-strength and water- and water-vaporproof papers, for improving the sizing degree, emulsions for nondusting and nonpicking printing papers, dyes, and bleaching agents. The author emphasizes the fact that this cross section of the products of one company does not cover the entire range of developments in Germany. 20 references. E.S.

TAYLOR, K. A. Besides more chlorine . . . there is much the paper industry needs from the chemical industry. Chem. Eng. News 29, no. 6: 450-1 (Feb. 5, 1951).

The author states that only a small fraction of the potential use of chemicals in the paper industry has been realized. In order for the chemical industry to co-operate with the paper industry in supplying more of its needs, the requirements of the paper field must be described in a language more intelligible to research departments, and they must learn more about the basic fundamentals involved in papermaking and methods for influencing them with added materials. As far as the needs of the paper industry are

concerned, any material which, when added to the furnish, will substantially influence any of the important properties of paper in the right direction without destroying other necessary properties or prohibitively increasing the cost, will prove useful. The possibility is suggested that the chemical industry could use those wood components which are dissolved out in the pulping processes as chemical raw materials. In the chemical pulping processes any means of shortening the reaction time or permitting the reaction to be carried out at reduced temperatures and pressures would be helpful. In a questionnaire prepared by the Committee on Coordination of Research of the American Pulp & Paper Association, the specific problems reported by the paper industry are: (1) further work on ammonia-base sulfite pulping, (2) recovery of chemicals from ammonia-base sulfite pulping, (3) recovery of chemicals from neutral sulfite semichemical waste liquors, (4) cheap effective germicide and insecticide treatments for stored pulpwood, (5) better dispersing agents for fibers, and (6) better and/or more economical fire-retarding and flameproofing materials. 1 illustration. M.W.

CHLORINATION PROCESS

MATAGRIN, AM. Delignification of cellulosic materials by means of chlorine and alcohol. Papeterie 72, no. 12: 647, 649, 651 (December, 1950). [In French] *cf.* B.I.P.C. 20: 478-9.

The author outlines the results obtained by Katzen and co-workers. 2 references. L.E.W.

CHROMATOGRAPHY

HOSSFELD, RALPH L. Paper partition chromatography of simple phenols. J. Am. Chem. Soc. 73, no. 2: 852-4 (February, 1951).

It has been found that satisfactory qualitative separation of many simple phenols (such as the phenolic degradation products of lignin) can be accomplished by the application of paper partition chromatography to a mixture of the sodium salts of phenyl azo dyes derived by coupling the phenols, pure or in mixture, with diazotized sulfanilic acid. Best results were obtained in the development of the sodium salt of *o*-cresylazobenzenesulfonic acid when Whatman No. 1 filter paper was sprayed to fiber saturation with 4% sodium carbonate and dried before spotting, and methyl ethyl ketone-water was used as the developer. The separation of dye mixtures was observed both by superimposed spotting of the individual dyes at a single location on the paper, and by spotting the mixed dye which resulted from the coupling of a mixture of phenols with the diazotized sulfanilic acid. Figures illustrate the results of this technique as applied to a mixture of phenol, guaiacol, and *o*-cresol, and to a mixture of guaiacol, phenol, *o*-cresol, *p*-cresol, and 2-hydroxy-1,4-dimethylbenzene. Mixtures of 4-hydroxy-1,2-dimethlybenzene with *p*-cresol and of *o*-cresol with *m*-cresol were not separated under the conditions of these experiments. 2 figures and 9 footnotes. M.W.

CLAY

LLAMBÍAS, HORACIO, and SANROMÁ, RENATO MARIO. Kaolin for the paper industry. Argentina. Instituto Tecnologico Serie A, no. 3: 15 p. (1950). [In Spanish]

Kaolin must be purified in most cases prior to its application in the paper industry. The requirements of a good kaolin are enumerated. The following tests on kaolin are described: moisture content, loss on calcination, color, particle size, sedimentation, bleachability, specific gravity, and retention. A procedure is also described for determining the particle diameter, which is based on Stoke's law; a special technique is outlined for preparing thin

sections of mixtures of kaolin and other substances and for differential staining. Tests for the presence of adulterants, and bleaching with hydrochloric acid, as well as with sodium sulfide followed by a hydrochloric acid treatment, are described. The possibility of electrolytic iron removal is also mentioned. 1 table, 2 figures, and 6 references. A.R.

MILLMAN, N. Viscosity control of concentrated clay suspensions. Paper Trade J. 132, no. 7: 28, 30, 32 (Feb. 16, 1951).

The viscosity of clays in concentrated suspensions depends to a large extent on the shape of the particles and on the composition with respect to particle size. Lowest-viscosity clays are those whose particle system is conducive to the greatest freedom of particle rotation. For free rotation the particle should be suspended in a sphere of liquid which encloses the particle, and the volume of liquid in relation to the volume of solid must be greater in proportion to the degree by which the particle differs from a sphere. Crystals of natural clays can be altered with respect to size and shape by the mechanical working of plastic crude clay bodies, thereby producing a particle system which has a reduced liquid requirement for particle rotation. 3 tables, 4 figures, and 4 references. M.W.

COLLECTIVE BARGAINING

BURKE, JOHN P. Labor relations progress. Fibre Containers 36, no. 1: 33-4, 36 (January, 1951).

Excerpts from the book "Part of the historical record of the labor relations between The International Paper Company and The International Brotherhood of Pulp, Sulphite and Paper Mill Workers" are given, which deals with the history of relations between the company and the union from 1902 to 1950. E.S.

COLOR

DAVIDSON, H. R. Visual sensitivity to surface color differences. J. Optical Soc. Am. 41, no. 2: 104-11 (February, 1951).

Several sets of data on visual sensitivity to color differences are now available. All of these data, however, have been obtained using optical arrangements differing from those employed in practical color matching. Data on visual sensitivity to color differences on textiles under ordinary viewing conditions have been obtained in this study to check the validity of the previous data for practical use. Observations were made by four professional colorists on a red, a blue, and a green series of wool dyeings. Each series contained about 20 samples, and each sample was judged independently against a standard three times by each observer. Since dyers' terminology was used, a means of conversion to I.C.I. notation had to be developed. The MacAdam ellipses are found to be a good representation of visual sensitivity to chromaticity differences under common viewing conditions, providing these ellipses are taken to represent a difference somewhat larger than a least perceptible difference rather than the one-third least perceptible difference reported by MacAdam. Visual sensitivity to differences in apparent luminous reflectance is found to be about 0.1 Munsell value step, or considerably poorer than that which has previously been reported. 4 tables, 6 figures, and 17 references. E.S.

CONTAINER INDUSTRY—EDUCATION

ANON. High school carton courses. Fibre Containers 36, no. 1: 97-8 (January, 1951).

Reference is made to the inauguration of courses on "Folding boxes; their design and manufacture" in two vocational high schools in New York,

with the aid of members of the New York group of the Folding Paper Box Association of America; an outline of the courses is given. The primary objective is to encourage capable young men to enter folding-carton manufacturing plants, where they may secure permanent employment. Many Association members may also profit by establishing similar training courses for their younger employees within their own plant, following the outline which is now available to them. 2 illustrations. E.S.

CORES

ANON. An expansible roll shaft. Pulp & Paper 25, no. 2: 72 (February, 1951).

The pneumatically expanded Collard paper-roll shaft and its first application at the Camas, Wash. mill of Crown Zellerbach are described (*cf.* U. S. patent 2,520,126 [Aug. 29, 1950]; B.I.P.C. 21: 129). 1 illustration. E.S.

CORROSION

COLLINS, T. T., JR., BAISCH, S. J., and VANDER VELDEN, G. T. Corrosion and field lining of sulphate digesters. Paper Trade J. 132, no. 6: 24, 26-7; no. 7: 18, 20, 22, 24, 26 (Feb. 9, 16, 1951).

Accelerated corrosion in two of the digesters of the Thilmany Pulp & Paper Co. led to research on possible preventive measures, the results of which are reported here. The information obtained from the literature is summarized in the first part of the article. After consideration of the literature and various recommendations of the International Nickel Co. and others, it was decided to line one digester with Inconel. This alloy was chosen because tests have shown it to be very resistant to corrosion by sulfate pulping liquors, and reports indicate that it is not subject to caustic embrittlement. The procedure which was followed in lining the digester is presented in detail. After six months the effectiveness of the method is such as to warrant using the same procedure for the company's other digesters. 1 table, 11 figures, and 62 references. M.W.

TEEPLE, H. O. Digester Corrosion Subcommittee. Tappi 34, no. 1: 67-8A (January, 1951); *cf.* B.I.P.C. 21: 391.

The minutes of the meeting are presented which was held in St. Louis, Mo. on March 30-31, 1950; the text of the questionnaire which was circulated to the industry is included. E.S.

COST—ACCOUNTING

BARNES, IRVING C. A paper mill accounts for its selling costs. Paper Ind. 32, no. 11: 1181-2, 1203-6 (February, 1951).

The author describes a plan of sales- or distribution-cost accounting developed by a hypothetical concern. The control of field-selling cost is greatly different from the control of variables in factory costs. The principal forms employed in the process are described and, in addition, an outline is given of methods for accumulating and maintaining information on the marginal profit and net profit yielded by company operations in individual product lines and individual cities. The plan is claimed to reduce the unit costs of selling and help in increasing the volume of business. 9 figures. E.S.

"ESTEVAN." Estimating and costing. Paper Box Bag Maker: 243-4 (December, 1950).

The functions of the estimator and the cost accountant of a business organization are described. The fact is emphasized that an estimator must

have an intimate knowledge of the company and all its functions in order to consider all the necessary factors concerned in an estimate. The cost accountant must record and tabulate every item of expense to a company and be able to indicate at any time the profits and losses of the company. The profit or loss forecast by the cost accountant should agree within 3% with that shown by the annual audit. M.W.

COTTON

GOLDTHWAIT, CHARLES F. Reaction of formaldehyde with cotton. Textile Research J. 21, no. 1: 55-62 (January, 1951).

Partially methylenated cottons have been prepared by the reaction of cotton with formaldehyde under acid conditions in nonaqueous (mainly acetone) solutions. Although it does not differ from ordinary cotton in appearance and general textile character, the modified cotton displays new properties even at relatively low formaldehyde contents—from 0.5% to 1.5%—which may prove to be of practical importance. The progress and uniformity of the reaction can be followed not only by analysis for combined formaldehyde, but also very conveniently by a determination of the reduction in the capacity of the cotton for taking up a direct dye. This work affords an excellent example of the possibilities of such dyeing techniques. Dye-resisting yarns of possible technological interest can be produced. The dye-resisting effect appears to be mainly caused by cross-bonding in the cellulose. The treated cotton has a decreased swelling capacity in water and in other agents which swell or dissolve cotton. Products of sufficient formaldehyde content have good resistance to biological rotting. Direct cotton dyes are made faster by the treatment. The cotton tends to lose strength as a result of acid hydrolysis and "embrittlement," but adequate strength can be retained for its prospective uses. Effects of moisture that is originally present in the cotton and in the reaction mixtures indicate that the state of swelling of the cotton at the time of treatment is especially significant in determining the properties of the reaction products. The methods which are described can be employed for the production of partially methylenated cottons of good uniformity and low degrees of substitution. 4 tables and 16 references. E.S.

MCCALL, ELIZABETH R., and JURGENS, JULIAN F. Chemical composition of cotton. Textile Research J. 21, no. 1: 19-21 (January, 1951).

The fiber properties of six samples of commercial raw cottons are tabulated, and the chemical analyses on them are reported for the following: cellulose, total sugars and reducing sugars, nitrogen, wax, ash, ash alkalinity, pH of the water extract, and the several organic acids present. The complete analysis of the ash of two of the cottons indicates that the principal metal present is potassium. 4 tables and 15 references. E.S.

DECULATOR PROCESS

HICKEY, WILLIAM W. New process is successful; solves air problem in Canadian mill. Pulp & Paper 25, no. 2: 80-1 (February, 1951).

Reference is made to the Deculator deaeration system for the removal of air from stock ahead of the headbox or, for newsprint, just after the screens. The stock is introduced into a large receiver in which an extremely high vacuum is maintained, near the saturation pressure corresponding to the temperature of the stock being handled. The deaerated stock is pumped by a fan pump from the Deculator receiver directly into the headbox. A

number of advantages result from the deaerated stock, such as a smoother, more uniform sheet, reduction in porosity, and fewer wet-end breaks. The first commercial installation was made at the newsprint mill of the Canadian International Paper Co. at Three Rivers, Que. (*cf.* Paper Mill News 74, no. 7: 16 [Feb. 17, 1951]). 1 illustration. E.S.

DISPENSING CONTAINERS

ANON. Griddle-ready. Modern Packaging 24, no. 6: 93 (February, 1951).

A ready-mixed pancake batter called Grid-1-Redi is being packaged in quart waxed paperboard cartons like those used for fluid milk. The product is sold through dairies as well as through wagon jobbers. The product is supplied to processors in a dry powder mix, and the processor adds liquid and emulsifies the finished batter. Dairies which handle the same type of carton for milk are ideally equipped to process and distribute the product, and the cartons are of convenient size and shape for dispensing and storing. 3 illustrations. M.W.

DOUGLAS-FIR

ANON. Superintendents' symposium: use of Douglas fir. Pulp & Paper 25, no. 2: 66, 68 (February, 1951).

A summary is given of the round-table discussion on the use of Douglas-fir (waste from wood operations and sawmills, as well as young second-growth thinnings) in kraft mills, which was held in Longview, Wash., in December, 1950. The products from Douglas-fir used alone or in combination with other wood species were declared superior; however, its pulping raises new production problems, and there is need for new and better equipment and construction materials for these mills. E.S.

DYES AND DYEING

DRAPER, A. J. M. Two-sided effects on paper. Paper-Maker (London) 121, no. 1: 30-3 (January, 1951).

With reference to the theories by Preston and Chen on the migration of dyes in textiles toward the source of drying (*cf.* J. Soc. Dyers Colourists 64: 60-4 [1948]), some properties of acid dyestuffs were investigated in relation to their tendency to produce two-sided sheets of paper. Handsheets were made under standardized conditions and then dried either by ironing or by suspension in air. In no instance did air drying show any two-sided effects. When the sheets were ironed, the dyes tended to concentrate on drying on the side nearest the hot iron, unless they had a special affinity for the pulp or were fixed in some way. The higher the moisture content of the sheet on ironing and the wetter the blotting-paper pad on which it was ironed, the greater was the migration toward the hot surface. Some dyes are precipitated by alum and thereby fixed, whereas others are fixed by virtue of an affinity for the size-alum precipitate. In the present experiments, the dyes showing the greatest two-sidedness (Alizarine sapphire blue 4G, Tartrazine, and Kiton red G) had little affinity for either pulp or size-alum precipitate and were not precipitated by alum. 4 tables and 6 references. E.S.

ELECTROVENTING

SURAN, JEROME J. Electric control of porosity. Modern Plastics 28, no. 6: 97-8, 100 (February, 1951).

Following a demonstration that the rate and type (simple orifice or frictional) of air flow depend upon the number and size of holes in a sheet

material, the electric control of these two factors by electroventing is described. Electroventing is accomplished by sending a series of arc discharges through plastic or paper sheets. The heat generated by the discharges will cause the plastic material to plasticize in the immediate area, and a permanent hole is made. A concentric layer of polymerized material is formed around the hole, and this accounts for the fact that plastic sheet materials may retain their electrovented holes even after the surface temperature is raised above that of the distortion temperature of the sheet. The thermal energy used to make the hole can be controlled by control of the current. The procedure in the commercial application of the process is described. Tests on the effect of electroventing on the strength of paper indicate little or no decrease in strength up to a critical value of porosity; it has not yet been determined whether similar relationships exist for plastic sheets. Possible applications of the process are discussed. 1 table, 7 figures, and 4 footnotes. M.W.

ESPARTO

ANON. Esparto as raw material for the paper industry. Allg. Papier-Rundschau no. 2: 57 (Jan. 26, 1951). [In German]

A brief review is given of the growth, collection, and uses of esparto grass in North Africa. The principal application is in the manufacture of paper which is almost exclusively made in Great Britain. There are only two mills in France, which use approximately 25,000 tons annually. The construction of three esparto mills in North Africa is contemplated. E.S.

EUCALYPTUS

FOSTER, D. H., SCHWERIN, GERDA, and COHEN, W. E. The existence of a uronic acid ester in young wood of *Eucalyptus regnans*. Australian J. Sci. Research A 3, no. 3: 504-11 (September, 1950).

A comparison has been made between the hydrolysis of the hemicellulose in young *Eucalyptus regnans* F. v. M. and the hemicellulose in holocellulose prepared from the same wood sample. The rates of hydrolysis of the pentosan and uronic acid constituents are compared. The experiments indicate that the carboxyl of uronic acid is combined in ester formation with carbohydrate or lignin and, in view of the results which have been obtained by other workers, it seems that the combination with lignin is very likely, but that the carbohydrate hydroxyl-uronic acid ester might easily co-exist. 2 tables, 3 figures, and 17 references. E.S.

EVAPORATION AND EVAPORATORS

REGESTAD, SIXTEN OLOF. The evaporation of black liquor—a literature review. Svensk Papperstidn. 54, no. 2: 35-51 (Jan. 31, 1951). [In Swedish]

A review of the subject is presented, covering the literature for the period from 1930 to 1950 under the following headings: physical properties of black liquor (dry-solids content, boiling temperatures, viscosity, specific heat, and calorific value), chemical methods of analysis, corrosion encountered in the evaporation of black liquor and problems of structural materials, deposits and incrusting substances formed during the evaporation of black liquor, heat-transfer problems, odor troubles during the manufacture of sulfate pulp, black liquor oxidation, evaporator systems, industrial evaporator installations, thermochemical and economic calculations, and miscellaneous operating problems. 8 figures and 64 references. E.S.

FIBER—TESTING

MORLIER, ORA W., ORR, ROLLIN S., and GRANT, JAMES N. The relation of length to other physical properties of cotton fibers. Textile Research J. 21, no. 1: 6-13 (January, 1951); *cf.* B.I.P.C. 19: 85.

Results are reported on tests of breaking load and elongation of single fibers at constant specimen length from the length groups of six cotton samples. A description is given of the instrument used in these tests. Average weight fineness of the center section of fibers from each length group was determined, and the tenacity and "stiffness" of the fibers were calculated. A method is described of calculating a single-fiber tenacity "index" for a cotton sample from the tenacity values of three modal-length groups. A high correlation is demonstrated between this index and the weighted mean single-fiber tenacity for the whole sample. 3 tables, 6 figures, and 12 references. E.S.

FIBERS

CALLOW, H. J. Bast fibres—physics and chemistry. Rev. Textile Progress 1: 63-82 (1949).

Recent literature relating to the study of bast fibers is reviewed, with particular reference to their structure and properties. For the most part, the references are from the period from 1939 to 1949. 61 references. M.W.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. TAPPI Fibrary. Tappi 34, no. 2: 26A, 28A, 30A, 32A (February, 1951).

The first catalog of 194 fiber specimens with pulping data is presented; representative samples of each fiber may be obtained from the Fibrary, The Institute of Paper Chemistry, Appleton, Wis., using the numbers assigned to the different fibers in ordering. This is only the beginning of the collection which was initiated in October, 1949; many additional fibers are needed. Addenda to this index will be published as the occasion requires. E.S.

FORESTS AND FORESTRY

ROTTIER, JACK. Green harvest at less cost. Pulp & Paper 25, no. 2: 74, 76, 78 (February, 1951).

Some of the forest-management methods of the Minnesota & Ontario Paper Co. are discussed, including the mechanical tree-planting program of jack pine, Norway pine, and white spruce with two Lowther planting machines drawn by tractors, methods for obtaining natural reproduction, cutting experiments, and forest-fire protection. 4 illustrations. E.S.

RUDEN, TOLLEF. The breeding of forest trees in Denmark and Sweden. Norsk Skogind. 4, no. 12: 365-72 (December, 1950). [In Norwegian; English summary]

An illustrated description is given of Danish and Swedish developments in the breeding of improved larch, poplar, spruce, pine, and birch species, as observed by the author during a study trip in the summer of 1950. 12 illustrations. E.S.

SMITH, G. H. G. Forestry can pay! Can. Pulp Paper Ind. 4, no. 2: 12-14, 16 (February, 1951).

Because Canadian reserves of mature timber are becoming scarce,

Canadians must soon change from exploitation to sustained management of their forest resources. Examples from forestry as a paying business from the southern United States are given and discussed. The conversion of the forests to the managed form will take longer in Canada than in the South; hence, Canadian planning should be started immediately. 5 illustrations.

E.S.

GROUNDWOOD PULP

KLEMM, KARLHEINZ. Studies concerning the moistening of wood for grinding. Das Papier 4, no. 23/24: 467-75 (December, 1950). [In German]

The grinding of wood with a high moisture content offers decided advantages in power requirements, in addition to the greater ease of barking; the purpose of the present study was to develop a rapid method for remoistening stored wood with a relatively low moisture content (i.e., increasing it from 17.5-25% to about 35-40% airdry). Logs were stored submerged in tanks in vertical and horizontal positions and floating on the surface; their moisture contents were measured at different intervals. The water was found to penetrate principally through the two faces of the logs; in the horizontal submerged position, the center of the log showed a lower moisture content than the ends, whereas in the vertical submerged position, the lower end showed a higher moisture content than the upper one; in most cases, the latter was even lower than that of the center of the log. It took at least three days for the submerged samples to reabsorb the required moisture—a period which is not economically feasible for medium-sized groundwood mills; wood floating on the surface did not reach the required moisture content during this period. The rate of absorption increases with increasing temperatures, especially in the lower ranges; the degree of drying of the dried wood and the manner in which the drying process had been carried out also exert an influence on absorptivity. It is decidedly lower in very dry wood than in less dried or moist specimens. Water penetrates the sapwood much more rapidly than the heartwood. Evacuation experiments showed that the subsequent penetration of water at 30-35°C. can be considerably accelerated; higher water temperatures seem to cause such a rapid swelling of the two faces of the logs that further moisture absorption is suppressed. Since the addition of caustic soda to the water increases the swelling tendency, it causes a similar decrease in moisture penetration. The results of the different experiments are illustrated in block diagrams. The most favorable conditions were obtained when logs, 1 m. long, were evacuated for two hours at a vacuum of 350 mm. mercury and then soaked for two hours in water at a pressure of 3 atm.; the total of four hours is nearly 1/12 of the period (47 hours) required for the plain soaking of similar logs to reach the same moisture content. 4 tables, 10 figures, and 4 references.

E.S.

GROUNDWOOD PULP, STEAMED

BRECHT, WALTER, and KILPPER, WILHELM. The total energy requirements of the steamed groundwood process as compared with those of the standard groundwood process. Das Papier 4, no. 23/24: 462-7 (December, 1950). [In German] *cf.* B.I.P.C. 20: 866-7.

To obtain a basis for comparing the heat requirements of wood steaming with the energy consumed in grinding in the steamed groundwood process (I), the heat balance for a mill-size digester was established, including calculations for a copper-lined (II) and a brick-lined digester (III). All results given in this article are based on theoretical calculations. The data indicated that (II) required 27% less heat than (III); the thermal requirements for steaming were converted to the corresponding kilowatt-hour

values, and it was then found that steaming consumed about one third of the total power required by (I). Compared with the standard groundwood process (IV), (I) is superior to (IV) with regard to energy requirements, because the total of thermal and mechanical energy is approximately 8% less than the energy consumed in standard grinding. When, in addition, consideration was given to the quality of the products of both processes by calculating the energy requirements for (I) and (IV) pulps of identical tear-through strength, 100 kg. of airdry pulp were found to require 51 kw.-hr. for (I) and 244 kw.-hr. for (IV); in another example (in which typical commercial pulps were used as the basis), the figures were 62 and 220 kw.-hr. for (I) and (IV), respectively. 7 tables, 2 diagrams, and 2 references.
E.S.

HEAT

ANON. Heat exchangers. Indian Pulp and Paper 5, no. 5: 232-3 (November, 1950).

The principle of heat exchange and general designs of liquid-liquid and liquid-gas heat exchangers are discussed briefly. E.S.

PFULG, FRANÇOIS. Thermo-economical problems in papermaking. Bull. assoc. tech. ind. papetière 4, no. 2: 41-61 (December, 1950). [In French]

The author emphasizes the need for better heat utilization in the paper industry and discusses the thermal problems of a paper mill under the headings: boiler house, drying equipment, and other uses of heat, with suggestions for improvement and stoppage of waste. 17 figures and 7 references.
E.S.

HEATING (HIGH-FREQUENCY)

KEGEL, KURT. The possibilities of high-frequency drying in the wood and paper industries. Das Papier 4, no. 21/22: 405-10 (November, 1950). [In German]

Following a brief introduction of the fundamentals of high-frequency heating and drying, examples and data of ordinary and dielectric drying of wood are given. High-frequency drying of paper is fundamentally feasible; however, it is not economical to use it exclusively for the entire drying process. Advantages may be obtained by steam drying the web to about a 30-35% moisture content, followed by high-frequency drying with rod condensers for the final drying. Another application can be made between the wet and drier sections of the paper machine where the paper travels free and unsupported for a distance of about two meters; here the moisture content may be reduced by 10-20% (depending upon width of machine, type of paper made, etc.), permitting a higher speed in the subsequent steam-drier section, which is not altered. This may be of significance if the productivity of a paper machine must be increased, and if the existing drier part is not sufficient for the purpose. Space requirements for high-frequency heaters are small, and the reconstruction and enlarging of buildings can thereby be avoided. By using high-frequency drying at the end of the drier section, a firmer paper results, cornification of the paper surface is reduced to a minimum, and the paper leaves the drier with a constant moisture content, irrespective of the initial moisture with which it entered the high-frequency drying zone. 1 table and 8 figures. E.S.

HISTORY

DONNELLY, FLORENCE. The beautiful mill. Paper Maker [U. S.] 20, no. 1: 23-32 (1951).

A history of the Lick Paper Mill and a biography of its founder, James Lick, are presented. The mill was built about 1850 at Santa Clara, California, and was first used as a flour mill. Later it became a paper mill, and today it is operated by the Commercial Solvents Corporation for the production of alcohols. The original mill built by Mr. Lick, which was destroyed by fire in 1882, had an interior finish of inlaid mahogany and was known as "the mahogany mill". 6 illustrations and 1 map. M.W.

ELLIOTT, HARRISON. Benjamin Franklin: paper mill promoter and patron. Paper Maker [U. S.] 20, no. 1: 35-40 (1951).

Although Benjamin Franklin was primarily a printer, he was also interested in the making of paper and was the foremost paper merchant of his time. His activities in this field are described. 3 illustrations. M.W.

KAPP, ARNO. The privilege of the paper mill at Cospuden. Wochbl. Papierfabr. 79, no. 1: 10 (Jan. 15, 1951). [In German]

One of the oldest German paper mills was constructed at Cospuden near Leipzig. It still exists in its original form, although it is no longer used for papermaking. The franchise of this mill dates from the year 1575; it was renewed in 1669, 1678, and 1785, and finally canceled in 1795. The text read that, within a radius of five miles in any direction of the mill, no other new paper mill was to be constructed, adapted, or permitted. 1 illustration. E.S.

KELLEHER, DENIS. Sir William Petty and his achievements. Paper Maker [U. S.] 20, no. 1: 41-8 (1951).

The colorful and varied career of William Petty, 1623-87, is traced. He was a map maker, physician, soldier, surveyor, teacher, author, inventor, and economist. His most outstanding accomplishment was the preparation of a map of Ireland which remained the official map of that country until 1922. 6 illustrations, 1 map, and 9 references. M.W.

WHEELWRIGHT, WILLIAM BOND. Zenas Crane; pioneer papermaker. Paper Maker [U. S.] 20, no. 1: 1-7 (1951).

The biography of a pioneer papermaker, Zenas Crane, 1777-1845, is presented. His mill was at Dalton, Massachusetts, where today the Crane Museum is the remaining part of the "Old Stone Mill". The Cranes have been paper manufacturers for five generations, and Crane & Company has, since 1879, made the paper used for United States paper currency. 6 illustrations. M.W.

ILLUMINATION

DERIBÉRÉ, MAURICE. Modern lighting systems in the paper industry. Bull. assoc. tech. ind. papetière 4, no. 2: 81-4 (December, 1950). [In French]

The author discusses illumination systems and the factors upon which good lighting in paper mills is based. E.S.

TUGMAN, J. L., and LINDSAY, E. A. How you can improve the lighting in your plant. Paper Ind. 32, no. 11: 1170-4 (February, 1951); *cf.* B.I.P.C. 21: 241.

The article is very similar to the previous reference. 16 illustrations. E.S.

INSECTS AND VERMIN

U. S. INDUSTRIAL CHEMICALS, INC. Pyrenone insecticides. Fibre Containers 36, no. 1: 102 (January, 1951); *cf.* B.I.P.C. 20: 245.

Pyrenone insecticides (10 parts of piperonyl butoxide and 1 part of pyrethrins) have been found effective in preventing insects from entering treated containers for periods ranging upward to one year. Paperboard, multiwall kraft bags, and wax papers have been treated; the insecticides are offered in powder or slurry form for clay coatings, in emulsifiable form for application from calender stacks, and in oil form for incorporation in molten waxes or other coatings, where compatible. Pyrenone insecticides do not involve toxicological hazards, skin irritations, or unpleasant odors; to date there has been no indication that their use has resulted in the development of resistant strains of insects. E.S.

KRAFT PULP AND PAPER

EVERY, DERNELL. Review of 1950 in the unbleached kraft paper industry. Paper Trade J. 132, no. 8: 58 (Feb. 23, 1951); Paper & Twine J. 24, no. 12: 24-5 (February, 1951); Paper & Paper Products 92, no. 12: 1, 14 (March 5, 1951); Am. Paper Converter 25, no. 3: 20 (March, 1951); Southern Pulp Paper Manuf. 14, no. 3: 46, 48 (March, 1951); Am. Paper Merchant 48, no. 3: 18, 32 (March, 1951). *cf.* B.I.P.C. 20: 565.

The kraft paper-manufacturing industry established a new production record in 1950 by producing 2⅓ million tons of unbleached kraft paper, a 23% increase over 1949 and an 8% increase over 1948. Sustained and urgent demands for kraft paper, as well as ideal supply conditions, made the attainment of this record possible. Because a lack of extensive expansion and the possibility of a shortage of supplies are anticipated, indications are that 1951 production of kraft paper will not exceed, but rather approximately equal, that of 1950. M.W.

LEVULINIC ACID

FROST, THOMAS R., and KURTH, E. F. Levulinic acid from wood cellulose. Tappi 34, no. 2: 80-6 (February, 1951).

Levulinic acid was produced from wood cellulose with mineral acids. Major yield-determining factors were found to be temperature, time, catalyst, and catalyst concentration. Investigations were carried out using temperatures from 150 to 190°C.; times from one to three hours; and catalysts that included hydrochloric acid, hydrobromic acid, sulfuric acid, and some salts. Acid catalyst concentrations were varied from 2 to 8%. The conditions for the production of the highest yield of levulinic acid from cellulose with hydrochloric acid were found to be quite flexible; i.e., at 150°, the yield was 44.6% with 2% acid at the end of three hours, 46.24% with 4% acid at the end of two hours, and 45.91% with 6% acid at the end of one hour. At 170° the yield was 46.85% with 2% hydrochloric acid after heating for one hour. Hydrobromic acid gave the maximum yield of 56.25% at a 4% concentration and after heating for one hour at 170°. Sulfuric acid gave lower yields under all conditions. The presence of arsenic trichloride inhibited the formation of levulinic acid, zinc chloride was of no benefit, and stannous chloride improved the yield. Further, it was found that when wood was subjected to similar conditions, it also produced levulinic acid plus furfural. 13 tables, 5 figures, and 11 references. E.S.

LIGNIN

DHINGRA, D. R., BHATNAGAR, M. S., and NIGAR, P. C. Lignin recovery from soda black liquor. Indian Pulp and Paper 5, no. 5: 223-9 (November, 1950).

A study was made to determine the optimum conditions of lignin recovery from soda black liquor using carbon dioxide as the precipitant. The results showed the optimum temperature for lignin separation to be 75-80°C., and the optimum specific gravity of the liquor for ease of separation to be 1.1. The flow time of carbon dioxide should be six to seven hours to precipitate the maximum amount of lignin. The pH of the partially neutralized liquor is about 7.5. A discussion of the structure of lignin and its principal uses is included. 14 tables, 3 graphs, and 11 references. M.W.

KUDZIN, S. F., and NORD, F. F. Investigations on lignin and lignification. IV. Studies on hardwood lignin. J. Am. Chem. Soc. 73, no. 2: 690-3 (February, 1951); *cf.* B.I.P.C. 21: 242-3.

Hardwood native lignin has been isolated from oak, birch, and maple. Chemical analytical data and ultraviolet and infrared absorption data on the native lignins were compared with those of softwood native lignin and were found to be in close agreement. Results of the Mäule test and of the oxidative isolation of vanillin from the lignins further illustrated the similarities between oak and birch native lignins and other softwood lignins. Maple native lignin was characterized as hardwood lignin. An approach to the solution of the difficulties in the identification of hardwood lignin is discussed. 1 table, 2 figures, and 14 footnotes. E.S.

LIME AND LIMESTONE

GIBBS, RALPH. Is your lime kiln stealing profits? Paper Ind. 32, no. 11: 1180-1 (February, 1951); *cf.* B.I.P.C. 21: 402.

Each rotary kiln has a potential productive capacity which will depend upon its physical dimensions. The empirical relation for optimum kiln production is shown in a graph developed by the author. Directions for checking the performance of the kiln are given, in case the actual performance figures do not equal or better those in the chart. The heat requirement of a kiln should not be greater than 10 million B.t.u. per ton of lime produced. The lime recovery plant can be made to pay its way if it is given the attention and care it deserves. 1 diagram. E.S.

MACHINERY—CONSISTENCY REGULATORS

BRIEN, F. Description and operation of two consistency regulators. Pulp Paper Mag. Can. 52, no. 1: 70-4 (January, 1951).

The author describes the construction, installation, instrumentation, and operation of two consistency regulators used on No. 2 and No. 5 paper machines of the Rolland Paper Co., which are based on the relation between consistency and viscosity. 2 tables, 10 figures, and 1 reference. E.S.

MACHINERY—CONVERTING MACHINERY

KNIGHT, JOHN W. Cartons from a web with "matched" blanker and aniline press. Am. Boxmaker 40, no. 2: 15-16 (February, 1951).

A new web-fed folding carton cutting and creasing press, combined with

a similar aniline printing press, is claimed by the manufacturer, Packer Manufacturing Co., Green Bay, Wis., to provide closely controlled register, high speed, and quality work for a large range of cartons. The press uses standard wood and steel rule dies and will produce a variety of cartons in many styles and classes of work at an average rate of 125 strokes/min. The operation of the press is described. In addition to speed and simplicity, the press has the advantage of permitting the slitting of a roll as it is fed to the aniline printing press and its passage through the press without being printed. This effects a savings in the purchase of standard-width rolls. The press is also fitted with a hydraulic system which allows the operator to break the contact with printing rollers without consequent loss of register. 1 table and 4 illustrations. M.W.

MACHINERY—CUTTERS

PFULG, FRANÇOIS. Modern rotary cutters. Bull. assoc. tech. ind. papetière 4, no. 2: 67-81 (December, 1950). [In French]

The author discusses the requirements of modern rotary cutters, the factors which enter into their selection for different purposes, and their construction, drive, and regulation. In conclusion, layboys and their operation are considered briefly. 6 figures. E.S.

MACHINERY—DRIVE

DONAHUE, F. J. Better V-belt drives for less money. Paper Ind. 32, no. 11: 1177-8 (February, 1951).

Two practical examples are given to emphasize the need of using care in selecting drives; particular stress is placed on the minimum permissible pitch diameters of sheaves. E.S.

MACHINERY—DRIVE, ELECTRIC

PHILIPPI, H. Electrotechnical problems in the pulp and paper industry. Das Papier 4, no. 23/24: 445-51 (December, 1950). [In German]

The author reviews recent developments in electric paper-machine drives, sectional-motor drives, and different regulator systems. In conclusion, brief reference is made to the special problems presented by electrically driven winders. 3 references and 13 illustrations. E.S.

MACHINERY—PUMPS

EGGER, EMILE. Special pumps. Bull. assoc. tech. ind. papetière 4, no. 2: 61-7 (December, 1950). [In French]

The advantages of Egger pumps for conveying pulp suspensions are outlined. 5 figures. E.S.

MACHINERY—REFINERS

BOUILLÉ, RENÉ DE. Cavitation in refiners. Bull. assoc. tech. ind. papetière 4, no. 2: 37-40 (December, 1950). [In French]

The author advances a hypothesis of the beating effect in conical refiners, in which he relates the hydration of the pulp with the phenomenon of cavitation. A refiner with a large clearance between the shell and plug will hydrate the pulp without cutting; this effect will be more pronounced at higher consistencies, whereas cutting of the fibers will increase with smaller clearances. In modern high-speed refiners, cavitation is accentuated, so that hydration predominates in spite of the low consistencies at which such refiners are operating. E.S.

MACHINERY—SCREENS

ANON. Chip screen for slab chippers. Can. Pulp Paper Ind. 4, no. 2: 18 (February, 1951).

The new Sumner "51" triple-deck chip screen is described, which was especially designed for service in small slab-chipping plants. 1 illustration. E.S.

MACHINERY—SUCTION ROLLS

TOURANGEAU, ROMEO. Uses in maintenance of suction rolls. Paper Mill News 74, no. 7: 8, 10, 12 (Feb. 17, 1951); Paper Trade J. 132, no. 11: 30, 32 (March 16, 1951).

Brief reference is made to some new applications of suction rolls in suction drum rolls, drum presses, cylinder couches, pickup and transfer rolls, extractors, and felt conditioners. The author outlines some of the more common troubles encountered in the operation of perforated rolls with internal suction boxes and gives useful directions for preventing and repairing the plugging of perforations, grooved or scored cylinders, and slipped rubber covers. The importance of correct alignment of rolls and proper lubrication is stressed. E.S.

MACHINERY—WIRES

TINKER, E. W. Woven wire cloth supply. Tappi 34, no. 2: 58A, 60A (February, 1951).

This is the text of the statement prepared by the Critical Materials Committee of the American Paper and Pulp Association with regard to the shortage of copper. Reference is made to W.P.B. Order L 209, issued in November, 1942, as an inventory control order for copper-woven wire cloth, and a similar control is recommended. E.S.

MATERIALS HANDLING

WEBER, H. F. R. Handling of finished pulp and paper products from the machine to the shipping dock. Tappi 34, no. 2: 73-6 (February, 1951).

The author describes the application of elevators and lowerers, and flush and elevated pallet-type conveyors to the handling of rolls of finished paper, that of apron conveyors to the handling of pulp bales, and the use of trolley conveyors in a warehouse. These examples cover only a few of the many types available for the handling of finished pulp and paper products. Each installation has been developed to solve a specific problem with the final objective of cost reduction. Most mills could profit from a study of their intraplant transportation of materials to determine where potential savings are possible. In making studies of this kind, the ideas of the men in the mill should not be overlooked; much of the progress made is the result of improvements suggested by the operating personnel. 8 illustrations. E.S.

WESTERN PRINTING & LITHOGRAPHING CO., *Racine, Wis.* Power trucks help solve paper handling problem. Am. Paper Converter 25, no. 2: 12-13 (February, 1951); Modern Lithography 19, no. 2: 35-6 (February, 1951); Natl. Lithographer 58, no. 2: 36, 84 (February, 1951).

The materials-handling methods of Western Printing & Lithographing are described. As many as 11 box cars and 12 highway trailers can be handled simultaneously in the main plant's enclosed docks. Everything possible is handled on various-sized skids, the height of which is standard. A battery-powered, clamp-style paper-roll handler is used for many operations. Stand-

up, rear-control, electric fork trucks are used for handling flat stock, finished products, and other unit loads of all kinds. Substantial savings in space, labor, and overhead costs, in addition to increased safety, less damage to materials, and more speed and efficiency have been effected by these methods. 5 illustrations in the first reference. M.W.

MICROSCOPY

WILDMAN, A. B., and APPLEYARD, H. M. Textile microscopy, with special reference to the microscopy of natural fibres. Rev. Textile Progress 1: 319-23 (1949).

Recent literature published principally during 1948 and 1949 in the field of textile microscopy is reviewed. 26 references. M.W.

MILL CONSTRUCTION

HRUBECKY, GEORGE F. Roofing maintenance. Tappi 34, no. 1: 58-9A; discussion: 59-61A (January, 1951).

The author reviews the types of roofing and roof decks, the elements of a roof, and the steps usually taken in repairing roofs. In question-and-answer form a discussion is given of some of the problems which engineers encounter in roof-maintenance work. E.S.

MILL CONTROL

BACHMANN, A. E. Operating principles as related to quality control. Tappi 34, no. 2: 14A, 16A, 18A, 20A, 22A, 24A (February, 1951).

The author discusses quality control as a basic control out of which all other controls develop and its relationship to many other functions, including routine and research quality control, operation, labor-relations policy, cost accounting (waste, production, cost, and budgetary control), and customer complaints. Useful suggestions for the successful operation of a quality control system are given. E.S.

MILL MANAGEMENT

WINSTON, C. C. Maintenance reports. Paper Ind. 32, no. 11: 1182-3 (February, 1951); *cf.* B.I.P.C. 21: 326.

A series of charts from an actual installation is presented which provide a basis for management to measure the effectiveness of the mill-maintenance program. The purpose of each of the following charts is discussed: force and work load, percentage of planned work, equipment downtime, stores inventories, and maintenance budget. 5 charts. E.S.

MOLECULAR WEIGHT

IVARSSON, BERTIL. The determination of the molecular weight of lignosulfonic acids by diffusion; the influence of continued sulfonation upon the molecular weight of lignosulfonic acids. Svensk Papperstidn. 54, no. 1: 1-18 (Jan. 15, 1951). [In Swedish; German and English summaries]

Information on the molecular weight of lignosulfonic acids (I) and their possible variations during the digestion of cellulosic materials is of significance for an understanding of the chemistry of the sulfite cooking process. The present investigation was carried out to ascertain whether or not degradation takes place on continued sulfonation of (I). For the molecular-weight determination, diffusion in glass-membrane cells was employed

Although this method does not yield perfect results, the absolute error in the determinations is slight. This fact and the high price of an apparatus for free diffusion motivated the use of glass-membrane cells for these preliminary experiments. Dialyzed spruce sulfite waste liquor was used as the starting material. The (I) isolated by precipitating with ethyl alcohol were further sulfonated at the same sulfur-lignin ratio as in the original cook. The resulting products were again treated with ethyl alcohol and yielded two fractions, one precipitated by alcohol (II), and a nonprecipitable fraction (III); both were compared with the (I) from the original cook. The molecular-weight determinations showed that all substances are polydisperse, and that the (II) resulting from both sulfonations have the identical mean diffusion constant. The presence of (III) following the second sulfonation seems to indicate that degradation takes place under the conditions of the experiment. Using Einstein's original theory and later modifications, (II) (approximately 75% of the fractions investigated) was estimated to have a molecular weight of about 8000. The diffusion cells were calibrated with Naphthol orange, sodium chloride, and sucrose. The concentrations of the (I) in solutions were checked spectrophotometrically in ultraviolet light. Experiments with Surfen (*cf.* Noll, B.I.P.C. 15: 235) as the precipitating agent in a turbidimetric method have also been made, and a satisfactory agreement with the spectrophotometric data was obtained. A literature survey is included, covering methods for the isolation of (I) from sulfite waste liquor with different reagents, different molecular-weight values obtained by different investigators, the theory and practice of membrane diffusion, different methods for the calibration of diffusion cells, and the calculation of molecular weights from diffusion constants. 7 tables, 16 figures, and 58 references. E.S.

NEWSPRINT

LAROCQUE, GERARD. Technical problems of the newspaper industry. Tappi 34, no. 1: 86A (January, 1951). [Abridgment] *cf.* B.I.P.C. 21: 249.

Reference is made to the requirements of newsprint for satisfactory printing on high-speed presses, ink absorption, and causes of paper breaks; a few questions and answers are appended. E.S.

TIPKA, VERNON L. Newsprint paper in 1950. Paper Trade J. 132, no. 8: 71-2, 74-6, 78 (Feb. 23, 1951); *cf.* B.I.P.C. 20: 576.

U. S. mills produced 1,004,000 tons of newsprint in 1950 and surpassed the 1949 production by 11.5%. Combined North American production last year amounted to 6,282,000 tons and exceeded the 1949 total by nearly 3.5%. Of this continental total, 16% was produced in the U. S., and 84% in Canada (including Newfoundland). The regular newsprint mills' productive capacities were utilized to the fullest possible extent. Indications are that in 1951 there will be a continuing demand for all the newsprint which can be manufactured. Statistical data are given for shipments, exports and imports, stocks, consumption, newspaper sizes and circulation, and advertising, including newspapers, periodicals, radio, and television. 8 tables and 3 diagrams. M.W.

PACKAGING

ANON. Army Engineers' Fort Belvoir Laboratory. Fibre Containers 36, no. 2: 43-4, 46 (February, 1951); Packaging Parade 19, no. 217: 86-8 (February, 1951).

At the packaging branch of the Engineer Research and Development Laboratories at Fort Belvoir, Va., experiments are being conducted to develop containers which will eliminate loss of materiel in military shipments

as a result of faulty packaging or improper processing before shipment. Some of the tests, e.g., vibration, incline-impact, revolving hexagonal drum, crate compression, and submersion tank tests, are described. Among the special projects under way at the packaging branch are the development of new and better methods of transporting engineer supplies by air, and the development of a mobile unit which will provide complete preservation, packaging, and packing facilities in the field. Improved permanency and legibility of shipping container markings is another problem under consideration. 7 illustrations. M.W.

CLAYTON, D. Corrosion prevention in packaging. Brit. Packer 13, no. 1: 49-52; no. 2: 29-30, 33, 35 (January, February, 1951).

The author discusses temporary corrosion preventatives. Their function is to protect metal surfaces against corrosion during transport and storage in such a manner that they can afterwards be restored to their original state by easy removal of the protective film. The common types of temporary corrosion preventives, their scope, the causes of failure, and the other properties which accompany materials giving corrosion protection are described; wrapping papers containing vapor-phase inhibitors are mentioned. M.W.

CRAFOORD, HOLGER. The packaging industry as paper consumer; a visit to AB Åkerlund & Rausing, Lund. Svensk Papperstidn. 54, no. 2: 53-60 (Jan. 31, 1951). [In Swedish]

The activities of one of the outstanding Swedish packaging enterprises are described, including testing, packaging machinery, contract packaging, contact with the United States, and exports. The consumption and grades of paper and board used in packaging are discussed; a chronological review of the development of the company from 1930 to 1950 is presented in tabular form. 1 table and 22 illustrations. E.S.

MODERN PACKAGING. Lipton tea. Modern Packaging 24, no. 6: 86-92, 178, 180, 182, 184 (February, 1951).

The outstanding success of the Lipton Company is due in large measure to the fact that it pioneered in the use of tea bags which, because of their convenience, became popular with housewives as well as with restaurants and hotels. The first tea bags were made of cheesecloth, which was later replaced by a special sterile surgical gauze. Tea bags made of filter paper were finally adopted, and Lipton's current tea bag is made from a base stock developed with an all-hemp base to provide a long-fibered paper with excellent tear strength. The heat-sealing quality is provided by filtering-thermoplastic fiber into the stock while it is being fabricated, which also adds wet strength. The bags are packed in a glassine bag which is folded over and placed loosely in the paperboard tuck-type carton. The cartons are cellophane wrapped and heat sealed. Lipton has also been successful in manufacturing and marketing dehydrated soup mixes which are packaged in laminated, heat-sealed foil envelopes. Lipton's packages are models of convenience, economy, and sales appeal and afford instant brand recognition. 16 illustrations. M.W.

MODERN PACKAGING. Substitution. Modern Packaging 24, no. 6: 77-83, 170, 172, 174 (February, 1951).

As a result of the present emergency, it is probable that American manufacturers will be forced to package their products in nonmetallic containers. Paper and glass will again be the most frequently used substitutes. Several examples of replacement packaging adopted during the last war are given,

and suggestions are made concerning the most suitable substitutes for various products. In conclusion, the following recommendations are made to packagers: (1) Review the characteristics of the product to determine what substitute packaging materials can be used; (2) make a study of every possible alternate material that would carry the product; and (3) be ready to convert speedily when it becomes necessary. 12 illustrations. M.W.

OSWIN, C. R. Packaging by C.T. & R. Brit. Packer 13, no. 1: 45-8 (January, 1951).

A scheme for selecting packaging materials in relation to climatic conditions in various parts of the world is presented. Although the meteorological data are not very detailed, they suggest a scheme for selecting suitable wrappers for goods which perish by drying or gaining water from the atmosphere. The "CTR" system proposed here is based on three figures which characterize the nature of the contents, the temperature, and the relative humidity of the storage atmosphere. The application of the system is explained and, although it offers only an indication, it is a guide which can be followed until field trials provide more accurate data. 1 map. M.W.

RAMSBOTTOM, J. M., GOESER, P. A., and SHULTZ, H. W. How light discolors meat: what to do about it. Food Inds. 23, no. 2: 120-4, 222-3 (February, 1951).

Self-service merchandising of packaged meats has emphasized the problem of discoloration of meats by light. A series of studies by Swift & Co. Research Laboratories on the effects of various types and amounts of lighting on fresh and smoked, cured, or table-ready meats are reported. The results of these tests are given. Three possible solutions presented are: (1) quick turnover in sales, (2) reduction in the amount of light, and (3) control of oxidation. The amount of light to which meat in transparent wrappings is exposed could be reduced by placing an opaque sheet or cardboard in the cellophane package and using that as the package front. Since the discoloration of fresh meat is a reduction process and that of processed meats an oxidative one, the type of wrapping chosen affords a means of solving the problem. Oxygen-permeable cellophane or Pliofilm should be used for fresh meats. For processed meats, a nonpermeable wrapping should be used with nitrogen or vacuum packing. 4 tables, 2 figures, 2 illustrations, and 4 references. M.W.

PALMYRA PALMS

TYABJI, F. S. The palmyra stages a come-back. Indian Pulp and Paper 5, no. 5: 242-3 (November, 1950); *cf.* B.I.P.C. 21: 99-100.

Brief reference is made to the part played by A. Periyanan in developing the use of palmyra stalks as a papermaking raw material. 2 illustrations. E.S.

PAPER—COATED

WENDT, M. E., and AIKEN, WILLIAM H. The effect of compounding variables on styrene-butadiene latex used for protective coatings for paper. Tappi 34, no. 2: 49-56 (February, 1951).

A coating composition consisting of a butadiene-styrene copolymer latex, an emulsified wax, and a thickening agent was studied as a coating for paper. Emphasis was placed on obtaining a coated paper with good grease resistance and a low water-vapor transfer rate. The type of wax used has a considerable influence on the results obtained. Best results were obtained with high-melting point microcrystalline waxes. At least 30 parts of wax solids per 100 parts of latex solids are necessary to give low water-vapor transfer rates. The use of a thickening agent improves resistance of the coating to

passage of water vapor. Addition of thickening agents also reduces tendency toward foaming. The coating must be heated to a temperature of at least 180°F. to produce a continuous film of coating on the paper. Maximum properties were obtained by fusion of the coating at 300°. On a 30-pound supercalendered kraft paper a water-vapor transfer rate of 1 g./100 sq. in. for 24 hours, and excellent grease resistance were obtained in the laboratory with approximately 15 parts of coating per ream. The same results have been obtained with production equipment at half this coating weight. These properties were not appreciably affected by creasing the sheet. 10 tables, 7 figures, and 7 references. E.S.

PAPER—CONVERSION

PACKIT ENVELOPE & BAG CO., *Chicago*. New envelope plant has modern features. Am. Paper Converter 25, no. 2: 10-11, 50 (February, 1951).

A description is given of the new plant of Packit Envelope & Bag Co. which incorporates many of the latest innovations in factory planning. All manufacturing and storage is done in a single, large, open area. This not only aids the flow of materials through the plant, but reduces noise and gives a sense of space, light, and air. Four illustrations and a floor plan of the plant are included. M.W.

PAPER—FILLERS

ANON. Potato paper. Chem. Inds. Week 68, no. 6: 16-17 (Feb. 24, 1951).

In a recent experiment in which refuse from potato starch manufacture was used in combination with wood pulp, a paper of greater strength and finer quality was made. Now tests with a full-strength potato mixture will be made by three paper mills. Pilot tests will be conducted at the paper and pulp department of the University of Maine. The potatoes will be beaten in a hammer mill, homogenized, cleared of grit, and mixed with the pulp. From the tests will be determined process feasibility, optimum proportions of potatoes to be used, required equipment, and the expense to the paper industry. The potatoes would replace only a small amount of wood, but the additional outlet for off-grade stock would be of great importance to the potato industry. M.W.

PAPER—MERCHANDISING

ANON. Bancroft Paper Company. Am. Paper Merchant 48, no. 2: 14-15, 38-42 (February, 1951).

The story of the Bancroft Paper Company and its success in building up a volume retail paper trade in rural Louisiana and Mississippi is presented. The means used by Bancroft to develop new markets include a training course for salesmen, complete sample books carried by salesmen, the establishment of paper departments in retail stores, and a company delivery service. The manner in which these factors can be effectively used is described. 2 illustrations. M.W.

PAPER—OPTICAL PROPERTIES

ANON. What makes paper white? Paper & Twine J. 24, no. 12: 14 (February, 1951).

Brightness is defined in TAPPI Standard T 452 m-48 as the reflectance of blue light which has an effective wavelength of 457 mμ. Its measurement is useful in the manufacture of white paper, because pulps with the

highest brightness values are those which, properly dyed, will produce the best whites. The four means of producing white paper are: chemical bleachings, white pigments, blue dyes, and fluorescent whitening agents. 1 illustration. M.W.

PAPER AND PULP INDUSTRY

BULLOCK, WARREN. Import problems 1950. Paper Trade J. 132, no. 8: 83 (Feb. 23, 1951).

The work of the Import Committee of the American Paper Industry is described. The committee is called upon by customs officials to classify imported special papers, some examples of which are cited, and may be requested by other agencies to classify paper. Its regular work, however, consists in the prevention of misclassification and undervaluation of basic paper grades. During 1950 there were about 50 borderline classification issues and nearly 250 separate court actions in which the Committee worked with the Government in its efforts to sustain the rulings of administrative officials. M.W.

CLAUSON, KARL A. Review of market pulp—1950. Paper Trade J. 132, no. 8: 66, 68 (Feb. 23, 1951); *cf.* B.I.P.C. 20: 577.

Whereas the demand for paper and paperboard continued to climb throughout the year, the supply of market pulp, although gradually tightening, was adequate for near-capacity operation of most mills. Preliminary figures by the Bureau of the Census indicate that the total receipts of market pulp at paper and board mills from all sources was approximately 2,870,000 short tons. The total consumption of market pulp by the paper and paperboard industry was about 2,900,000 short tons. This total is broken down by grade (sulfite, sulfate, and soda) and by the type of mill (integrated, semi-integrated, and nonintegrated) in a table. Charts which indicate the relationship between inventory and consumption are presented. The inventories of market pulp declined gradually from July to the end of the year, with every indication that this trend would continue well into 1951. The wood pulp-price structure strengthened throughout the year for all grades of market pulp. Because of the uncertainty of government regulations, supplies, etc., no prediction is made for 1951. 2 tables and 2 figures. M.W.

DOBROW, MORRIS C. More and more paper production records. Paper Trade J. 132, no. 8: 60, 62-4, 66 (Feb. 23, 1951); *cf.* B.I.P.C. 20: 577-8.

Following a brief general discussion of the current economic problems, the production situation in the paper industry is summarized. The 1950 production of paper and paperboard in the U. S. is estimated to have been 24,300,000 tons, a 20% increase over 1949. Although no accurate measure of consumption is available, it is assumed that consumption of domestically produced paper and paperboard in 1950 was between 23,300,000 and 23,900,000 tons. The capacity of the U. S. paper industry was 24,425,000 tons at the end of 1950, and facilities for producing an additional million tons per year of paper and paperboard are being built. However, since the per capita consumption is at present about 375 pounds and growing steadily, the paper requirements of the country will be such as to occupy all existing paper-machine capacity in the immediate future. Pulpwood consumed by the U. S. pulp industry in 1950 increased by 14%, while inventories decreased by 25%. Waste-paper campaigns are getting under way to supplement the fiber supply, and about 27% of the total consumption of paper in the country is now being salvaged. The supply of wood pulp is at record levels, but consumption requirements have exceeded the gain in supply. At the rate of pulp consumption early in 1951, there is little likelihood of inventory ac-

cumulation. Since indications point to a considerable increase in paper and paperboard consumption, the application of government regulations may become necessary in order to spread the fiber supply over a greater yardage by reducing basis weights and limiting consumption. 3 tables and 1 figure. M.W.

EVANS, ROBERT H. How to postpone pulp allocations. Paper Trade J. 132, no. 8: 90-2 (Feb. 23, 1951).

Because present-day conditions in the market-pulp supply differ in many ways from conditions during World War II, when pulp allocations were used successfully to distribute the supply, the author recommends other measures rather than allocation to meet the present situation in the market-pulp industry. The first step should be the reinstatement of the limitation orders of the type of L-120, possibly accompanied by a ban on excessive or unnecessary uses of paper. He further recommends a Government order restricting each mill's market consumption to a fixed percentage of its 1950 usage. The third point, aimed at market-pulp producers, is to urge them to adjust their deliveries so as to give all their customers as nearly as possible the same proportion of their deliveries as in 1950. In conclusion, the co-operation of integrated mills is requested in staving off a policy of pulp allocation by selling pulp to the converter mills. M.W.

FOWLER, R. M. A review of the pulp and paper industry in 1950. Pulp Paper Mag. Can. 52, no. 1: 62-5 (January, 1951); *cf.* B.I.P.C. 20: 503.

Both in value and in tonnage the output of the Canadian pulp and paper industry was substantially higher in 1950 than in 1949, and well above the record levels established in 1948. One of the more significant features of the year's operations has been the greater intensification and emphasis on research throughout the industry. The author reviews developments and trends in pulp, newsprint, other papers, paperboard, pulpwood, and forests during 1950, with particular reference to the increased evidence of interest in the forests by their owners, the provincial governments, which own nine tenths of all the woodlands in Canada. 1 figure. E.S.

HALL, GÖSTA. Orientation of production in the Swedish pulp industry. Bull. assoc. tech. ind. papetière 4, no. 2: 25-36 (December, 1950). [In French]

The author discusses the economic aspects of the Swedish pulp and paper industry, with particular reference to bleached and dissolving pulps. The work of the Swedish Forest Products Laboratory in Stockholm is outlined. 3 tables. L.E.W.

HILL, ALLAN C. Canadian possibilities 1951. Paper Trade J. 132, no. 8: 118, 120 (Feb. 23, 1951); *cf.* B.I.P.C. 20: 579.

Following a brief summary of Canadian production of pulp and paper in 1950, the author considers the outlook for 1951. Production of Canadian pulp and paper in 1951 should exceed that of 1950. New pulp installations are under construction and should be producing additional supplies of pulps in 1951; the policy of increasing the production of existing newsprint machines is continuing. Full operations depend primarily on adequate wood supplies and the availability of woods labor. The transportation situation for both wood and finished products is causing some concern, as is a shortage of sulfur. Indications are, however, that these problems will be solved. M.W.

JOHNSON, GEORGE V. Paper exports and world demand. Paper Trade J. 132, no. 8: 95-6 (Feb. 23, 1951).

The importance of the exportation of paper and paper products to both the paper industry and to world economy is stressed. M.W.

LARSON, L. K. Criteria for pulp allocations. Paper Trade J. 132, no. 8: 86, 88, 90 (Feb. 23, 1951).

The case against the use of pulp allocations to remedy the present shortage of supply is presented. Although allocations were successful in solving a similar problem in World War II, the same conditions do not prevail now. Imports of market pulp are currently available from all normal supply sources. The foreign pulp industries currently have access to many substantial available outlets besides the U.S., and wood pulp commands higher prices in other world markets. These factors and others make it appear that allocations are not only unnecessary and impractical, but dangerous at the present time. Rather, a careful distribution policy with limited controls, where necessary, is recommended. M.W.

RITCHIE, JAMES L. Wood pulp supply. Paper Trade J. 132, no. 8: 57 (Feb. 23, 1951); Paper Mill News 74, no. 8: 99 (February 24, 1951); *cf.* B.I.P.C. 20: 579.

The supply of wood pulp available for domestic consumption in 1950 was the highest on record. This country's new supply of wood pulp last year totaled over 17 million tons, an increase of 24% over 1949. The new supply of market pulp also established an all-time record in 1950, with a 37% increase over 1949. The highest operating rate in history occurred in the domestic pulp industry. Domestic pulp production totaled 14,827,000 tons, exceeding 1949 production by 22%. Domestic sales were at a peacetime high and constituted 45% of our total market-pulp supply. Indications are that the level of domestic capacity will continue to rise in 1951. Imports from Canada exceeded 1949 imports by 30%, and constituted 10% of this country's total new supply of pulp in 1950 and 36% of its market-pulp supply. In 1950 the U. S. received 92% of Canada's total exports of wood pulp, and barring work stoppages, current expansion in Canadian capacity and fuller utilization of existing facilities could result in larger exportable surpluses of Canadian wood pulp this year than last. In 1950 the U. S. received 19% of our total domestic new supply of market pulp from Europe. Some decline in the volume of overseas' imports seems indicated for 1951. However, if full potentialities of North American supply can be realized, and the decline in overseas' imports minimized, this year's total supply of pulp may exceed that of 1950. M.W.

STEVENSON, LOUIS T. The paper industry and freedom of enterprise. Paper Trade J. 132, no. 8: 84, 86 (Feb. 23, 1951).

The interdependence of the American system of free enterprise and the paper industry is discussed. M.W.

TURCOTTE, L. The pulp situation. Paper Trade J. 132, no. 8: 133-6 (Feb. 23, 1951); Am. Paper Converter 25, no. 3: 13, 48 (March, 1951); Pulp & Paper 25, no. 4: 48, 50, 52 (April, 1951).

A review of the wood pulp situation in 1950 points up the importance of adding to pulp inventories rather than depleting them when a slight business recession occurs, as in 1949. A decreased production in that year resulted in a subsequent shortage. New pulp facilities will be constructed to provide for increasing demand, but they will have to be built in more remote areas where there is ample timber. Production costs in new plants will be higher, and higher pulp prices will prevail. The wood supply for pulp manufacturing

is adequate for our domestic use, but world demand for pulp without a world supply of raw materials will make for a very close situation in supply and demand for a long time to come. M.W.

WILBERT, T. R. Market woodpulp—1951. Paper Trade J. 132, no. 8: 92, 94 (Feb. 23, 1951); Am. Paper Converter 25, no. 3: 13 (March, 1950).

Domestic pulp supplies in the U. S. were at the highest level in history in 1950. If shortages of sulfur or pulpwood do not occur, there is a good possibility that the total U. S. production of market pulp this year will equal or exceed that of last year. The total market pulp supply will depend to a great extent on the amount which can be imported, and in all probability there will be a loss of some tonnage from abroad. If this is to be kept at a minimum, price regulations on imported pulp must be clarified. Although the prediction is for a slightly smaller total market supply this year than last, the industry does not appear to be threatened with a drastic shortage of market wood pulp. M.W.

YOWELL, L. Q. Paper merchants optimistic for 1951. Am. Paper Merchant 48, no. 2: 16-18, 28-30, 32 (February, 1951); *cf.* B.I.P.C. 20: 504.

The results of a survey of business conditions within the paper industry show that the industry experienced an average increase in business of 15% during 1950. The paper merchant expects this trend to continue in 1951, although at a slightly lower rate, provided the manufacturers can supply the merchandise. The trends in various parts of the country are discussed, and analyses of trade association executives are given. In general, these analyses concur with the viewpoint of the merchants. M.W.

ZIEGLER, MAX. Pulp and paper manufacture in North America. Textil-Rundschau 6, no. 1: 12-20; no. 2: 66-75 (January, February, 1951). [In German]

The author (who participated as one of the four Swiss paying guests in the North American study trip [groups pulp, paper, and social problems] arranged by ECA in the spring of 1950) describes the organization of the trip and his impressions during visits to mills in the Middle Atlantic States, the South, the Pacific Coast, and the Lake States, including special equipment and processes used by these mills. Consideration is also given to the development of the industry, scientific management, productivity, simplification, instrumentation, job evaluation, human relations, safety, and research; conclusions are drawn with regard to the applicability of the observations to Swiss conditions. 8 figures. E.S.

PAPER AND PULP INDUSTRY—PUBLIC RELATIONS

ARNST, ALBERT. Planning a public information program. Paper Trade J. 132, no. 6: 19-20, 22-4 (Feb. 9, 1951).

The author describes the public information program of the Weyerhaeuser Timber Co. This program was aimed primarily at the company's employees in an effort to provide a clear understanding and a more thorough knowledge of the company's interest in them, in the community, and in the welfare of the nation as a whole. Part of the program was also directed to the public through booklets and newspaper advertising campaigns. One phase of the program involved the training of supervisory personnel and, through them, the employees. An intensive questionnaire is being prepared to test the effectiveness of the campaign. 8 illustrations. M.W.

PAPER AND PULP MILLS

ANON. Potlatch mill makes history. Pulp & Paper 25, no. 2: 28 (February, 1951); Paper Ind. 32, no. 11: 1156-7 (February, 1951); *cf.* B.I.P.C. 20: 259.

Brief reference is made to the fact that the first paper was made in the new Potlatch mill, Lewiston, Idaho, an affiliate of Weyerhaeuser, on December 22, 1950, 11 months and 7 days after the ground was broken. 1 illustration. E.S.

PULP & PAPER. New mill in West; No. 3 machine for Bellingham. Pulp & Paper 25, no. 2: 34, 36, 38, 40 (February, 1951).

The new Beloit tissue machine of the Pacific Coast Paper Mills of Washington, Bellingham, Wash., and the auxiliary equipment are described, which are housed in a new reinforced concrete building. The machine, a Yankee Fourdrinier, trimming 78 inches, is equipped with a new Beloit air-cushioned, control-flow headbox; it produces 25 tons of facial-type toilet tissue per day. The purchased bleached sulfite pulp is mixed with a small percentage of groundwood and prepared in a Jones Pulpmaster. 12 illustrations of the equipment. E.S.

PAPER SPECIALTIES

ANON. Concentrated milk developments. Fibre Containers 36, no. 1: 98, 100 (January, 1951); Packaging Parade 19, no. 217: 67 (February, 1951); Modern Packaging 24, no. 7: 88-9, 154, 156 (March, 1951).

The possibilities of concentrated milk developments for the paperboard-container industry are discussed, particularly in the field of nonfrozen, fluid-milk concentrates. Although dairies are cautious in making predictions, they admit that the change in merchandising methods of milk concentrates would be sweeping, and paperboard containers would be the logical answer. With regard to frozen-milk concentrates, they would probably be marketed in tin cans from freezer cabinets in grocery stores in a manner similar to frozen juices. E.S.

ANON. [Developments in the industry during World War II] Tappi 34, no. 2: 56A, 58A (February, 1951).

An alphabetically arranged list is given of developments in the pulp and paper industry made during the last conflict. E.S.

ANON. Insecticides on bitumen/paper laminates. Paper Market: 12 (January, 1951).

A report in the Australian Defense Research Laboratories' Technical Note 11 on the effects of insect repellents and insecticides on bitumen-paper laminates is quoted. An investigation was made on the causes of "bleeding" of laminate-lined cases with the resultant staining of the contents. It was found that in each case either naphthalene or *p*-dichlorobenzene was present in the package for protection against insects. Tests conducted on laminates treated with naphthalene, *p*-dichlorobenzene, and DDT showed that the bitumen absorbs naphthalene and *p*-dichlorobenzene vapors and is plasticized by them. This lowers the melting point of the bitumen and causes it to "bleed" at high temperatures. Pure DDT was found to have a negligible effect. The conclusions stated that neither *p*-dichlorobenzene, naphthalene, nor crude DDT should be used with or enclosed in bitumen-paper laminates, but that a talc which contains 10% pure DDT powder is a suitable insecticide for such applications. M.W.

DAY, FREDERICK T. A concise index of wrapping papers. Brit. Packer 13, no. 1: 53-5 (January, 1951).

Specialty wrapping papers used by various trades for packaging are defined and described. M.W.

FAGG, ELIZABETH. Deluxe office catering depends upon paper packaging. Paper Sales 11, no. 2: 13, 40 (February, 1951).

A new field for paper sales is suggested by a short-order service, called Dial & Dine, which caters to office workers in the midtown Manhattan area. The success of this service is largely due to special packaging by which food is kept hot or cold for as long as two hours. Virtually everything is packaged in paper, supplemented with aluminum foil to maintain an even temperature. The menu includes sandwiches, salad bowls, hot plate specials, and soups and beverages. Everything is delivered ready to serve, in clean, tempting packages which are easily disposable. A new "Paper Casserole" department will give similar service to home and apartment dwellers. 2 illustrations. M.W.

RUNDELL, FORREST. Characteristics of the papers in the uncoated field. Inland Printer 126, no. 4: 66-8 (January, 1951).

The properties, quality, and printing characteristics of the following uncoated papers are described: high bulk, antique, eggshell, English finish, halftone plate, and supercalendered. M.W.

RUNDELL, FORREST. Sell a book by its cover? Inland Printer 126, no. 5: 47-8 (February, 1951).

Covers add attractiveness and protection to catalogs and brochures; for paperbound books they provide an important selling value. Because of the great numbers of different uses for cover stocks, they are made in greater variety of colors, finishes, and surfaces than any other type of advertising papers. Grades range from the supercalendered, which are made to protect magazines, to the heavy soilproofs. The properties and advantages of the various types are described. M.W.

TIMER, JULES E. Flexible corrugated material. Am. Paper Merchant 48, no. 2: 20, 42 (February, 1951).

Flexible corrugated is a B-flute material with indentations across the corrugated medium. These indentations are so placed as to facilitate folding around corners and edges without rupturing the product. The B-flute corrugations enable the user to multiply the folds of paper at points where shock and pressure are liable to cause damage; the placement of the extra cushion accounts for the additional protection afforded the package. Many types and grades of flexible corrugated are available, and the scope of its use is practically unlimited. New government specifications are being prepared for it. M.W.

PHYSICAL TESTING—FASTNESS TO LIGHT

GODLOVE, I. H. Uniformity of grading of American, British and German lightfastness standards. Am. Dyestuff Reptr. 40, no. 4: P114-18 (Feb. 19, 1951); *cf.* B.I.P.C. 21: 415.

The author answers the criticism of the British Committtee concerning his use of the Adams formula for measuring the degree of fading of standards for lightfastness and his conclusion that the American standards are more evenly graded than the British or German. He contends that the Adams

formula is one of the best of the 10 available, that it is most convenient, and that it is especially accurate for small color differences when the change of hue (shade) is slight. He repeats his contention that the American light standards are more uniformly graded than the European. As a supplement to the point-by-point answer, it is suggested that a committee work on light-fastness standards to reach an agreement with respect to an instrumental measurement of a "definite break" in fading tests. It is also indicated that, by the use of presently available optical instruments, fastness ratings could be determined with one short and one long exposure of a set of light standards and a sample of unknown fastness. 10 references. M.W.

PHYSICAL TESTING—MOISTURE

LANDROCK, ARTHUR H., and PROCTOR, BERNARD E. Measuring humidity equilibria. Modern Packaging 24, no. 6: 123-30, 186 (February, 1951).

The basic methods in current use for measuring the equilibrium relative humidity (E.R.H.) of a substance—the R.H. at which the substance will neither gain nor lose moisture under given temperature conditions—are outlined, and details of a new test are presented. One of the methods now in use consists of direct measurements of water-vapor pressure by manometric techniques. A second method consists of direct measurements of E.R.H. by the use of an electric hygrometer. A third method requires that the samples be brought to actual weight equilibrium when exposed to a series of different R.H.'s. The following techniques of each method are described: (1) manometric method—the method of Adams and Merz; and the apparatus of Makower and Myers; Vincent and Bristol; and Legault, Makower, and Talburt; (2) electric hygrometric method—methods of Graebner, Yee, and Brockington; and (3) weight equilibrium method—methods of Dittmar, Makower and Dehority, Yee and Davis, Cleland and Fetzer, Wink, Hellman and Melvin, and Karon and Adams. The new test, called a graphical interpolation method, was developed by the authors at the Packaging Research Laboratory of the Department of Food Technology at the Massachusetts Institute of Technology. In this test a number of samples of a given moisture content are weighed out and exposed to controlled atmospheres of different R.H.'s, for a constant period of time at a constant temperature. The gain or loss in weight by the samples is determined, and these values are plotted against the R.H.'s, with the gains appearing above and the losses below a "zero baseline." A smooth curve is drawn, and the E.R.H. is interpolated at the point where the curve intersects the baseline. These steps are repeated for the product at several other initial moisture contents, and the usual moisture equilibrium curve is drawn from the E.R.H. values obtained. This method is based on the principle that the rate of gain or loss in the moisture of a product at any given initial moisture content and atmospheric R.H. increases with an increasing difference between atmospheric and product vapor pressures. Since the E.R.H. is equal to the water-vapor pressure of the product divided by the saturation water-water vapor pressure at the same temperature, the rate of gain or loss in moisture increases with the increasing difference between atmospheric and product R.H.'s. In this equilibrium method the test time has been held constant. The E.R.H. is found to be independent of the test time when samples which contain an identical moisture content are used. A detailed outline of the procedure is given, and the results of some tests are interpreted. In general, the results are in excellent agreement with results obtained by other methods on similar products. This technique applies to a wide variety of food products, and indications are that it can also be used for paper and plastic materials. 2 tables, 5 figures, and 21 references. M.W.

PHYSICAL TESTING—PAPER—ERASURE TEST

VAN DEN AKKER, J. A. Instrumentation studies LXI. Erasability of paper. I. A general discussion of erasability. Tappi 34, no. 2: 89-92A (February, 1951).

Definitions and statements concerning erasability obtained from recognized technical people in the writing paper industry are presented and discussed. The various factors which are called into play in a judgment of erasing quality are enumerated and discussed, with particular reference to the probable success or failure of control or measurement of the factors. It is concluded that a concise, yet adequately specific, definition of erasability is not to be expected. The phenomena of erasure should be studied with research equipment, and such a study may form the basis for a later, detailed definition of erasability. 6 references. E.S.

PHYSICAL TESTING—PAPER—GLOSS

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Contrast gloss of paper at 57.5°. Tappi 34, no. 2: 86A (February, 1951).

This is a revision of TAPPI Official Standard T 424 m-45, which is recommended for measurements of the tendency of paper of low gloss (newsprint, writing, and ledger papers) to glare when observed under improperly distributed light. It is not recommended for shiny papers, such as supercalendered, waxed, glassine, or colored papers. The apparatus, test specimen, procedure, and method of reporting are outlined. 8 references. E.S.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Specular gloss of paper at 75°. Tappi 34, no. 2: 87-8A (February, 1951).

This is the text of TAPPI Tentative Standard T 480 m-51, which is recommended for measuring the specular reflectance of paper at 75°; its chief application is to coated book, waxed, and other shiny white or colored papers which measure from about 15 to 70. It should not be used for cast-coated and other papers reading 80 or higher. The apparatus, gloss standards, test specimen, procedure, and method of reporting are outlined. 1 figure and 5 references. E.S.

PRINTING AND PRINTER'S INK

ANON. Protective coatings. Inland Printer 126, no. 5: 85 (February, 1951).

The latest advance in decorative and protective coatings for the printed piece is plasticoating, which consists of laminating a film of cellulose acetate, vinylite, or other plastic film on top of the printed piece. This is the most costly of the coating processes, but it is superior in durability and attractiveness. Press overprint varnishes have also been improved so that they closely approximate spirit varnishes. Although spirit varnish, because of its inherent advantage and the manner of application, is better looking, overprint varnishing is more economical, can be used over some inks not fast to spirit, and can be completed in the printing plant. The antioffset spray gun has made it possible to perform a complete print in a single operation when using high-gloss inks and overprint varnish. M.W.

BUGGIE, HORACE H. Halftone printing and uncrushed corrugations. Fibre Containers 36, no. 1: 53-7 (January, 1951).

Following a brief outline of the reasons for previous failures in attempts to print corrugated boxes with rubber halftone plates, a new process is described which takes advantage of some of the peculiar properties of rubber. Because rubber is relatively noncompressible, although deformable, only the border sections of a plate with large solid areas are free to submit to deformation, whereas the central areas present a more or less solid, unyielding surface, which results in uneven pressure on the board. The new rubber plate uses a coarse halftone screen with the area broken up into a series of halftone dots, each surrounded by open areas, which permit the individual dots to deform in a more or less uniform manner. The result is a more uniform pressure on the corrugated board without crushing of the flutes; a substantial saving of ink, reduced offset and ink throwing, better adjustment of rolls, and three-dimensional effects of the printed surface are claimed for the new process. The life of the plates, on the other hand, is shorter, and the cost of the dies ranges from two to four times that of conventional rubber dies. 5 illustrations. E.S.

CHAPMAN, S. M. A review of the literature on printability and allied subjects, 1947-1949. Proc. Tech. Sect., Can. Pulp Paper Assoc. 36: 197-205 (1950); *cf.* B.I.P.C. 18: 542.

This review covers the period from September, 1947, to September, 1949; as in previous years, an attempt has been made to confine the subject to articles relating to the printing-use properties of paper or paperboard, whereas articles relating exclusively to printing, printing ink, or other allied topics have been largely disregarded. The subject is reviewed under the subheadings: testing methods, general printing properties, printing troubles, and miscellaneous. 62 references. E.S.

JOHNSON, FRANK B. The ABC's of gravure. Tappi 34, no. 1: 82-5A (January, 1951).

Gravure is a photomechanical method of intaglio printing whereby tone values are produced from incised cells or dots. The details of the process, its advantages and limitations, and the preparation of gravure cylinders are outlined. The suitability of the stock for gravure printing must be carefully tested, and the use requirements of the printed article made known to the printer. Dollar bills and postage stamps are excellent examples of fine gravure printing. In conclusion, brief reference is made to the Dultgen process, a variation of the gravure process which incorporates the halftone dot. E.S.

MARTIN, JOSEPH. Remarks. Tappi 34, no. 1: 85-6A (January, 1951).

Supplementing the preceding paper by Johnson, the author discusses various applications of commercial rotogravure (roll rewind and sheet delivery). Almost any material can be printed by gravure, including paper, board, cellophane, glassine, foils, textiles, oilcloth, wallpaper, box covers, etc.; the limiting factor is the cost of the printing cylinders, so that production is usually confined to fairly large runs, unless quality is a requisite. When quantity requirements are present, rotogravure not only offers higher quality, but also economy. E.S.

ST. JOHN, EUGENE. Standards for estimating ink coverage. Inland Printer 126, no. 5: 49-50 (February, 1951).

The basic printing element in the calculation of the ink needed for coverage is the form, and it is the only fixed element that enters into the calculation. The characteristics of paper that affect coverage include levelness, ab-

sorbency, and receptivity. Qualities of ink that affect coverage are strength of color, specific weight, opacity, and consistency of body. Each of these factors is discussed, and the method of calculating the percentage of solid in the form, the first step in estimating, is presented. 1 table. M.W.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. *Pacific Section.* Printing and print papers. Tappi 34, no. 2: 66A, 68A, 70A (February, 1951). [Abridgments]

In a general discussion of the subject, the following papers were presented, listed by authors and titles: Adler, Maurice. Ink problems in printing, p. 66A; Bell, Milton. Problems arising in the printing of paper on an offset press, p. 66A, 68A; Cranor, G. R. Quality control of printing papers, p. 68A; and Wright, Bruce H. The influence of pulp characteristics in printing paper, p. 68A, 70A. E.S.

RADIOACTIVITY

FEARNSIDE, K. The use of isotopes in the paper industry. Part 5. The elimination of static electricity. World's Paper Trade Rev. 135, no. 3: 148, 150, 152 (Jan. 18, 1951); *cf.* B.I.P.C. 21: 265.

Following a brief description of the undesirable results of the production of static electricity and the systems in use for its removal, the beta-ray-emitting static eliminator developed by Isotope Developments, Ltd., is described briefly. It consists of a thin tube of stainless steel inside which the radioactive material is deposited. The walls of the tube are sufficiently thick to allow safe handling; the tube is mounted in a semicircular shield provided with a removable lid which, when closed, cuts off the radiation altogether. The beta-radiation from the source penetrates the walls of the tube and ionizes the air in its immediate vicinity; when a paper sheet passes over the eliminator, it is completely discharged; the earthed shield provides an immediate leakage pass for the static. Any installation of this type should be placed immediately before the point at which the paper is required to be discharged, because it will be readily recharged by further handling. Static is sometimes generated in a position to which the beta-radiation cannot penetrate, for instance, inside reels of coated paper or transparent films. Radium eliminators with sufficient gamma-radiation can be used in this case, or the beta eliminators can be provided with supplementary gamma sources. However, it is essential that the operators be shielded from the penetrating gamma-radiation, or undesirable health hazards may result. Wherever possible, the beta-emitting type should be used. Commercial production awaits the delivery of strontium-90, a pure beta emitter with a half-life of 25 years. 1 diagram. E.S.

RAYON

ENTWISTLE, D. Rayon—physics and chemistry. Rev. Textile Progress 1: 47-62 (1949).

The author reviews the progress in the application of physics and chemistry to the study of rayon covered in the literature for 1949, with a few previous references. 95 references. M.W.

TREIBER, E. Micellar structure of cellulose hydrate. Monatsh. 81, no. 7: 1007-16 (Dec. 15, 1950). [In German]

Micellar formation and size of cellulose fibers spun from viscose are affected only by very large changes in concentration; a large decrease in concentration gives a poorer structure. Spontaneous coagulation gives only slightly distorted micelles. The coagulated product from cuprammonium solution shows a definite increase in the intensity of reflex A_4 in relation to A_3. Normal

cuprammonium threads, spun into alkali, show relatively good micellar structure, but those precipitated from zinc chloride are poor, as compared with normal Hermans fibers from viscose. 1 table, 4 figures, and 25 references. J.W.G.

RAYON—STATISTICS

RAYON OR'GANON. Annual rayon review . . . Rayon Or'ganon 22, no. 2: entire issue (February, 1951); *cf.* B.I.P.C. 20: 587.

U. S. rayon production in 1950 totaled 1,259,400,000 pounds, an all-time record which exceeded by 12% the previous record year of 1948, and was 27% greater than the 1949 output. All divisions of the industry were at peak production levels. The latest available estimate on world rayon production is 3,500,000,000 pounds, which was 29% greater than the 1949 production and 24% over the previous peak year of 1941. The entire issue is devoted to statistical information on domestic and foreign rayon production, supplemented by tabulated data and graphs. M.W.

RAYON—VISCOSE PROCESS

BARTUNEK, RICHARD. The experience with new wood pulps in the viscose industry. Das Papier 4, no. 23/24: 451-5 (December, 1950). [In German]

In addition to the conventional spruce sulfite dissolving pulps, with or without akaline purification, other dissolving pulps have been developed recently which differ either in the raw material employed (beech, pine, southern pines, black gum, and other hardwoods), the cooking method (sulfate, magnesium bisulfate, and nitric acid processes), bleaching procedures (multistage and chlorine dioxide bleaching), or purification methods (prehydrolysis, and warm, hot, pressure, and mechanical purification). Recent developments in the properties of rayon (I) and tire-cord dissolving pulps (II) are reviewed. In the case of (I), a degree of whiteness has been reached which is equal to that of cotton linters; the resin content has been reduced to approximately 0.15%. After complete resin removal, synthetic resins may be substituted, which are supposed to counteract certain difficulties resulting from the complete lack of resins and to improve spinning conditions. In general the residual ash is kept as low as 0.1%, with the exception of manganese which, if present in certain amounts, is claimed to reduce the aging period. Significant improvements in the filtering properties have been obtained, although the optimum has not yet been reached. Depending on the requirements of the converters, the dissolving pulp is delivered in different sheet forms; the yields of rayon from wood pulps have been increased. With regard to (II), efforts are being made to develop pulps which are equal to cotton linters; the most important use requirements are high strength properties (tear, twist, and folding endurance in particular), with high elongation of the resulting yarn and cord. The realization of these aims is attempted by continuous pressure purification of spruce sulfite pulps and by the application of the sulfate method to conifers and deciduous species, with prehydrolysis and alkaline purification. However, there is still a considerable gap between linters and wood pulps. Analytical methods for the evaluation of the suitability of a dissolving pulp are discussed briefly. 2 figures. E.S.

DAVIS, W. E. Polymolecularity of viscose rayon and rayon-grade pulps. Ind. Eng. Chem. 43, no. 2: 516-21 (February, 1951).

Tire-cord viscose rayons prepared from chemical cotton and wood pulps frequently differ in fatigue resistance and other dynamic properties. This study was made to determine whether or not this variation correlates with differences in molecular weight and molecular-weight distribution of the rayons and

the original celluloses. It was found that fatigue resistance correlates fairly well with the amount of low-molecular weight material in the rayon, whereas tenacity correlates with weight-average molecular weight. A strong correlation was found between the amounts of low-molecular weight material in the pulps and in the corresponding rayons. The results emphasize the importance of controlling the amount of low-molecular weight material in viscose rayon for tire cord. The strong correlation between amounts of low-molecular weight material in the pulps and rayons suggests that improvement in rayons from wood pulps might be obtained by more thorough steeping, unless there is a difference between wood pulp and chemical cotton in the rate of generation of low-molecular weight material during the aging of alkali cellulose. This last point is of fundamental interest in cellulose chemistry and should be examined further. 10 tables, 3 figures, and 18 references. E.S.

REEDS

PORPHYRE, J.-A. Reeds. Papeterie 72, no. 11: 597, 599 (November, 1950). [In French]

Data are given on the dimensions of reed fibers (*Phragmites communis*), collection, and cooking conditions. L.E.W.

RESEARCH LABORATORIES

HOLMES, WHEELER O. The Institute of Paper Chemistry. Paper Maker [U. S.] 20, no. 1: 53-8 (1951).

The functions and achievements of the Institute are described. 8 illustrations. M.W.

RESIN, SYNTHETIC

ANON. Resin dispersions and emulsions as coatings and adhesives. Brit. Packer 13, no. 2: 24, 35 (February, 1951).

Following a brief discussion of the various types of plastics used for coatings, the principal requirements for resin dispersions and emulsions as coatings or adhesives for packaging materials are summarized. The desirable qualities are: (1) high solids content at low viscosities, (2) stability and resistance to temperature change, (3) compatibility with other compounds used in the coating process, (4) high binding power, (5) freedom from toxic and inflammable solvents, (6) ease of use at high speed, (7) rapid drying qualities, (8) slightly alkaline pH, (9) good aging properties, and (10) satisfactory mechanical properties. Other considerations include flammability, cost, and ease of application. M.W.

ROCHOW, T. G., and STAFFORD, R. W. Coatings. Anal. Chem. 23, no. 2: 212-16 (February, 1951).

A report on the recent progress in the field of coatings is presented under the following headings: general analytical schemes for organic coating, resinography and depiction of macromolecules, specific classes of high polymeric materials, oils, pigments, and specific constituents. 164 references. M.W.

SPEYER, FRED B., and CHAMPLIN, LOUIS, JR. Suspensoids make polyamide resins more versatile. Am. Paper Converter 25, no. 2: 9, 30 (February, 1951).

General Mill's polyamide resins, which have found extensive use in the paper industry as coatings, adhesives, and laminating resins, have now been prepared in water-dispersion form. The resins are dimerized vegetable oil

acids in combination with ethylenediamine, and the polyamide resin suspensoids are cationic dispersions of the resins in water. The various types of compounded suspensoids, which are opaque, white liquids containing 35 to 42% solids, vary in viscosity from 0.4 to 15 poises. They are remarkably stable and resistant to temperature changes. When applied to paper or cloth, they produce smooth, opaque, white films which are water, water-vapor, grease, oil, and solvent resistant. They easily pass the blocking tests established by TAPPI Standard T 447 m-47. Advantages of the suspensoids include: (1) higher solids content at low viscosities, (2) greater ease of application (no need for hot-melt or solvent equipment), (3) better control over the penetration of resin into paper, (4) economy, (5) safety, and (6) freedom from solvent odors. The suspensoids are available in four grades, the properties of which are summarized in a table. They may be diluted, and organic solvents or plasticizers may be added to them to improve particular properties. Although the suspensoids are normally cationic, the charge may be reversed so that they become compatible with many anionic resin emulsions, dispersions, and latices. Among the suggested uses for the suspensoids are the improvement of the flexibility, water resistance, and blocking resistance of polyvinyl acetate emulsions and, by the reduction of the sealing temperature and tackiness of certain synthetic rubbers, their adaptation for use as heat-sealing materials. 2 tables. M.W.

SALESMEN AND SALESMANSHIP

RUNDELL, FORREST. The salesmen's corner. Inland Printer 126, no. 4: 48-50 (January, 1951).

Some suggestions for printers and paper salesmen to use in appealing to customers are presented. One idea is to furnish a dandy roll with the customer's trademark on it. The development of a system of forms in a variety of colors which will distinguish the form and help to route it will often impress a customer. The suggestion of the correct quality of paper for the intended use is important. Complete customer satisfaction is ensured by studying an order and using some simple but effective technique to distinguish the customer's printed matter from that of his competitors. M.W.

SETUP BOXES

ANON. Calculations for cardboard boxes. (IV). Allg. Papier-Rundschau no. 2: 54-6 (Jan. 26, 1951). [In German] *cf.* B.I.P.C. 21: 421.

A sample calculation is given of the cost (in Germany) of a cheap, hinged-lid, shouldered setup box with partitions for the packaging of five ampoules. 2 tables and 1 illustration. E.S.

WELLBROCK, RICHARD. Use new machines to cut overhead; 32% profit on every extra M boxes. Am. Boxmaker 40, no. 2: 12, 14 (February, 1951); Boxboard Containers 69, no. 699: 21-2 (March, 1951).

The Clement Moore Associates, Inc., Philadelphia, found that the national average for direct labor and overhead in the setup-box industry is 23.3 and 25.7%, respectively. The wrapping machine is the key to both items of cost. Improved materials-handling techniques can reduce the direct-labor ratio, and extra production will absorb overhead. A proper line-up of machinery and the coupling of machines for continuous processes are recommended. New gluers which utilize more of the available capacity of the wrappers can be joined to each wrapper, and production will be increased with no increase in overhead. 1 table and 1 figure. M.W.

SHIPPING CONTAINERS

ANON. Prize winning General Motors packages. Fibre Containers 36, no. 1: 58-9, 62 (January, 1951).

An illustrated description is given of two prize-winning packages at the Fourth Annual Protective Packaging and Materials Handling Competition at Philadelphia in October, 1950. One package constituted a service and repair kit, including a cylinder liner, piston, piston pin, retainers, and a complete set of piston rings and won first place in the Corrugated or Solid Fibre Division; it also received honorable mention for its inner package design. The other winning entry was a fuel-injector package in a fiber can and was awarded first prize in the General Division. 3 illustrations. E.S.

SHIPPING CONTAINERS—LOSS AND DAMAGE CLAIMS

ANON. Reporting results of transportation and packing survey. Packaging Parade 18, no. 215: 72-3 (December, 1950).

The first annual report of the Transportation and Packing Survey for the year ending September 15, 1950, presents an analysis of some of the data developed during inspection of 1051 cars in ten cities. The survey was sponsored jointly by U. S. railway systems and the Fibre Box Association. The general conclusions derived from the report are: (1) Some shippers have considerably more damage than other shippers of the same commodity; (2) there is a sizable difference in average damage per car in different cities; and (3) the size of the inner container bears some relationship to the amount of damage which may be expected. Specific data on apparent reasons for damage and revenue and claims payments are summarized in tabular form. 4 tables. M.W.

SHIPPING CONTAINERS—MULTIWALL BAGS

POCTA, FRANK. American life and industry; their effect on the shipping sack situation. Paper Trade J. 132, no. 8: 80, 82 (Feb. 23, 1951); *cf.* B.I.P.C. 20: 590.

The total demand for multiwall bags in 1950 amounted to over 2.25 billion sacks, an increase of 35.12% over 1949. Of the entire production, 30.57% was for food and agricultural products, 31.01% for chemicals, 29.22% for building materials, 8.15% for minerals, and 1.05% for miscellaneous commodities. The facilities for the manufacture of multiwall paper shipping sacks in the U. S. are ample, but are restricted by available shipping-sack kraft. Because the shipping-sack industry is dependent upon so many other industries, its future in 1951 is difficult to predict. M.W.

SHIPPING CONTAINERS—TESTING

PORCELAIN ENAMEL INSTITUTE. *National Safe Transit Committee. Technical Planning Division Sub-Committee.* National Safe Transit test shipments. Fibre Containers 36, no. 1: 38, 43-4, 46, 48 (January, 1951).

Following a brief outline of the functions and objectives of the subcommittee, the results of a series of in-transit shock tests are described and discussed, which were staged to determine the vibration and shocks received by a packaged product from the time it left the manufacturer's production line until delivered to the final consumer. The tests through the entire delivery cycle were principally run to provide a scientific confirmation of the usefulness of the test cycles recommended in the NST program. The sa-

lient point revealed by them is the fact that the most serious hazards to which a packaged product is subjected during the shipping cycle is the handling it must go through while being loaded, unloaded, and handled in transit. This holds true regardless of the type of carrier employed (air cargo, railway express or freight, and truck); the excessive shocks occur as soon as the human element enters the picture, including car shifting and trailer and truck movements controlled by personnel in charge of the particular carrier vehicle. The shock data are illustrated in four block charts; they indicate that en route the plane records the least shocks and the railroad cars the most, although it seems possible that trucks come close in intensity when traveling on broken city streets. The express car seems to be in a special class for the type of merchandise it handles; the shock in most instances is of little greater intensity than that experienced by air cargo. In the matter of handling before and after shipment, air cargo and express appear best, with truck and rail the worst. However, it must be borne in mind that trucks account for many more handlings than any of the other carriers, since they carry the goods to the ultimate destination in most cases. The fact is brought home to the manufacturer that irrespective of the carrier used, handling results in the worst shocks to the merchandise; all handling with all modes of transportation showed shocks into the fifth zone, which seems to correlate with about a 12-inch drop in the testing laboratory. These tests convinced the committee that the NST program in requiring fifth-zone shock as the minimum requirement for packaged products actually requires no more than the conditions normally encountered in transportation and handling. 1 table and 6 figures. E.S.

SILICATE OF SODA

MACGONAGLE, F. ROBERT. Silicate of soda uses in the paper mill. Tappi 34, no. 1: 77-8A (January, 1951); Paper Mill News 74, no. 10: 16-17 (March 10, 1951).

Following a brief discussion of the available forms of sodium silicates, the author describes their application as beater additives and for rag cooking, deinking, pulp bleaching, and water treatment. Miscellaneous uses around pulp and paper mills include their application to concrete floors for inhibiting dust and wear, the addition of activated silica sol ahead of the paper machine for improving flocculation, as a coating for greaseproof paper, and the use of sodium sesquisilicate to improve the rheological properties of high-solids casein mixtures. E.S.

PHILADELPHIA QUARTZ COMPANY. [Silicate adhesives for paper tubing] Silicate P's & Q's 31, no. 2: 2 p. (February, 1951).

The use of silicate adhesives for spiral and convolute paper tubing and the application process are described. Paper tubing constructed with silicate adhesives is not only tightly bound, but is extremely strong and firm because of the rigid silicate film within the tubing wall. The film acts as a barrier in retaining the flavor of foods, preventing the transmission of oil, or keeping water vapor in or out of a package. It is also rodent and insect repellent. 1 illustration. M.W.

SAMS, ROBERT H., and MCCREADY, NEWTON W. The contribution of sodium silicate to the stiffness of paperboard. Tappi 34, no. 2: 67-70 (February, 1951).

The strength of unbonded plies of straw and kraft paper and of plies bonded with sodium silicate has been tested by several methods. The silicate adhesive considerably increases the rigidity as shown by ring crush, column crush, and stiffness tests, whereas the bursting strength decreases some-

what, more sharply on kraft than on straw. It is more economical to increase the rigidity of paperboard by using additional sodium silicate than by using heavier paper. 2 tables, 10 figures, and 2 references. E.S.

SLIME PREVENTION

BERG, HARVEY E., and SANBORN, J. RAYMOND. Slime control in paper mills—some questions and answers. Tappi 34, no. 2: 81-5A (February, 1951).

Information on the most frequently occurring problems in slime control is presented in question-and-answer form. E.S.

SARTORETTO, PAUL A. Slime acclimatization. Tappi 34, no. 1: 72-3A (January, 1951).

Biological data are presented comparing the effectiveness of chlorinated phenols, mercurials, and mixtures thereof against slime cultures of mixed organisms which were taken from slime boards of paper mills. The penicillin cup method was found to be the best bacteriological test for this purpose; it showed strikingly the variable performance of slimicides against slime samples gathered from different sources, thereby substantiating the concept of slime acclimitization. *Aerobacter aerogenes*, the most prevalent organism in slime, was found to be an unreliable comparison standard for testing the effectiveness of slimicides. Attention is drawn to the compatibility of mercurials and chlorinated phenols which will coprecipitate, forming mercurial salts of the chlorinated phenols up to a certain dilution; the pH and the proper dilution at the point of mixing must be carefully watched. 1 table. E.S.

SODA MILLS

PULP & PAPER. Tennessee efficiency; planned town—improved mill. Pulp & Paper 25, no. 2: 48, 50, 52 (February, 1951); *cf.* B.I.P.C. 21: 270.

The modernization program of the Kingsport Division of the Mead Corp. is described. 7 illustrations. E.S.

SPECIFICATIONS

BALDWIN, M. G. Give suppliers the "dope." Fibre Containers 36, no. 1: 92-6 (January, 1951).

A system is outlined which is used by the Colgate-Palmolive-Peet Co. for furnishing written instructions, information, and other specifications to the suppliers of papers, inks, plates, and other materials employed in making finished paper packaging materials; examples of printed forms are included. Although it may sound complex, the system is not considered needlessly involved, because occasional errors are still made. 6 figures. E.S.

STARCH

POTTER, A. L., and HASSID, W. Z. Starch. IV. The molecular constitution of amylose subfractions. J. Am. Chem. Soc. 73, no. 2: 593-5 (February, 1951); *cf.* B.I.P.C. 20: 428.

The molecular weights of potato and corn amylose subfractions were determined by osmotic pressure measurements and by estimation of their chain-lengths with the periodate oxidation end-group method. A comparison of the molecular weights by the two methods indicates that, like in the parent amylose, the molecules of the potato subfractions constitute single

chains. However, the corn subfractions, like the unfractionated material, appear to be slightly branched, or may contain branched components which cannot be removed by the usual procedures of separation. The intrinsic viscosities and the molecular weights of the linear amylose subfractions show a relationship which can be expressed by the following formula: $[\eta] = 0.00166\ M$. Using this expression, the approximate molecular weight of an amylose from various plant sources can be determined from its intrinsic viscosity. 2 tables, 1 figure, and 5 references. E.S.

STATISTICAL METHODS

CHESLEY, K. G., WHITE, R. W., and HOGG, R. V., JR. Correlation of B.O.D. and chemical tests on industrial effluents. Tappi 34, no. 2: 86-8 (February, 1951).

In a study on the combined effluents from a kraft pulp and paper mill and a hardwood distillation plant, statistical techniques have been used to determine the correlation between five-day B.O.D. values and data from tests on oxygen consumed by permanganate and total solids. The results indicate that, within the range of 34 to 436 p.p.m., the B.O.D. of the industrial waste can be calculated from these data, and a control set up which can be used with confidence. 3 tables and 7 references. E.S.

STEAM POWER

BROWN, ROBERT. Ste Anne modernizes steam plant. Can. Pulp Paper Ind. 4, no. 2: 20-22 (February, 1951).

A brief outline is given of the modernization program of the steam-power plant of the Ste. Anne newsprint mill at Beaupre, Que., which involves the revamping of the three 23-year-old boilers. The first step, the modernization of the No. 1 boiler, was completed in August, 1950; the changes are described briefly. The improved unit can now produce 75,000 lb. of steam/hr. at 225 p.s.i. and 550°F., as compared with 55,000 lb./hr. before the changes were made. 3 illustrations. E.S.

STRAW

STONE, J. E. The briquetting of straw. Can. J. Technol. [previously Can. J. Research F] 29, no 2: 98-110 (February, 1951).

The large tonnage of straw produced in the Canadian Prairie Provinces has for many years received attention as a possible source of fuel; however, the problem of collection presents the same problem as in other contemplated outlets for this material. There are few locations where straw is concentrated to a greater extent than a few hundred tons, and for this reason a light, portable briquetting machine is required which could be driven to the strawstacks or used in conjunction with a pickup baler. The present investigation deals with certain preliminary data which are essential for the correct development of such a machine. It was found that small discus-shaped briquets (weighing approximately 15 g. each) could be made from wheat straw by the application of heat and pressure without the use of a binder. The most suitable temperature is 220°C., the size of hammered straw 2 in., and the pressure, a minimum of 5000 p.s.i. Higher pressures produce a stronger and more moisture-resistant product; the pressing time may be reduced and the thickness of the briquet increased. A moisture content in the raw material of less than 10% is recommended. It has been determined that about 50 times as much energy may be obtained from the briquets by burning as is required for their manufacture. Further information, particularly of an economic nature, can only

be obtained with a full-scale machine running at its normal operating speed, as in this way the important effect of frictional heating can be determined. 5 tables, 5 figures, and 25 references. E.S.

STREAM POLLUTION

ALLEN, D. E. Bergstrom tower; removal of effluent toxic compounds. Pulp & Paper 25, no. 2: 56, 58-9 (February, 1951).

The author describes the Bergstrom tower installation at Springfield, Ore., for the removal of compounds toxic to fish from kraft mill effluents (*cf.* U. S. patent 2,282,112 [May 5, 1942]). The tower is not the only improvement in the design of the mill as far as pollution is concerned. A four-stage washing system has cut the soda loss to only one to three pounds per ton of airdry pulp. The floor drainings from the digester building and liquor room, as well as the discharge from the green liquor dregs, are carried to an outside solar pond to avoid their addition in high concentration to the river. A Sveen Pedersen saveall has reduced the fiber loss to an average of 0.11 lb./1000 gal. of excess white water. Data on the tower efficiency in removing sulfides and mercaptans from kraft effluents and on the chemical concentrations in the combined sewer effluent are presented in tabular form. Tests during the period of low-water flow of the McKenzie River for the past two summers have shown that even the lowest river dilution precludes any harm to fish life. 3 tables, 2 figures, and 2 references. E.S.

CONWAY, J. M. [Hoberg Paper Mills plans] Tappi 34, no. 2: 52A, 54A, 56A (February, 1951).

The company plans the construction of a plant for the evaporation and burning of sulfite waste liquor as soon as state authorities approve the project. E.S.

ERSPAMER, AUGUST S., and RICE, WILLIAM D. Stream improvement—settling pulp and paper mill waste waters and dewatering bulk solids. Tappi 34, no. 1: 73-7A (January, 1951); *cf.* B.I.P.C. 20: 44-5.

The article is very similar to the previous reference. 4 tables, 5 figures, and 2 references. E.S.

FRENCH, LEWIS C. A burning attack on pollution. Am. Forests 57, no. 2: 22-3, 32, 34-6 (February, 1951).

As a result of the work of the Wisconsin state committee to investigate the stream pollution problem and to enforce antipollution laws, Wisconsin paper mills have been engaged in research to find an acceptable means of disposing of sulfite waste liquor. Northern Paper Mills of Green Bay and other Wisconsin paper mills which use the sulfite process are building equipment to spray condensed sulfite waste liquor into fire pits in place of coal. The amount of heat produced compares favorably with that from coal, and the chief advantage of the process is the possibility of the complete disposal of the waste liquor which has not been fulfilled in other means of its utilization, such as in the manufacture of yeast or vanillin. The limiting factor in the conversion of sulfite waste liquor to fuel is cost, which at present exceeds that of coal. However, this process was selected as the most promising for development by Northern Paper Mills where construction of burning equipment designed to reduce the pollution effect by 40 to 50% is under way. Other mills which have similar plans ready for approval by the state committee include the Hoberg Paper Co.,

Green Bay, the Badger Paper Co., Phestigo, the Rinelander Paper Co., Rhinelander, and the Niagara mill of the Kimberly-Clark Corp. 3 illustrations.
M.W.

MURDOCK, HAROLD R. Industrial wastes. Ind. Eng. Chem. 43, no. 2: 73-4A, 76A (February, 1951).

The advantages of the Texas plan are described, which was initiated by A. J. Krell and which is sponsored by the Engineering Extension Service of Texas Agricultural and Mechanical College. It consists of a series of 10 two-hour lectures presented not at the college but at four industrial areas of the Texas gulf coast by an unbiased educational organization to a mixed group of key industrialists and local government agencies. One course has been completed and two others are in preparation. The procedure is a practical method of teaching the basic principles of stream and air pollution to the key personnel with whom rests the responsibility for the implementation of sound industrial waste-disposal programs. Every watershed confronted with purity problems could benefit from such an approach.
E.S.

SUGARS

YUNDT, ALBERT P. Aldose end-group estimation by cyanide consumption. Tappi 34, no. 2: 95-6 (February, 1951).

A method of aldose end-group measurement in which hydrogen cyanide was used to react with the carbonyl group to form a cyanohydrin is reported. Hydrogen cyanide and sodium hydroxide were produced by the hydrolysis of sodium cyanide. The addition of ammonium nitrate removed the hydroxyl ions because the excess ammonium ions repressed the ionization of the ammonium hydroxide. The reagent used was mercuric nitrate which contained ferric nitrate as an indicator and nitric acid. The test procedure as first devised and the modified test developed later are described. 2 tables, 1 figure, and 2 references.
M.W.

SULFITE WASTE LIQUOR

ANON. "Big Inches" for SWL; disposal pipelines in West. Pulp & Paper 25, no. 2: 55, 84 (February, 1951).

New developments in the disposal of sulfite waste liquor on the West Coast involve two specially constructed pipelines which carry their effluent to deep water and which are constructed with the approval of the Washington State Pollution Commission. One line was constructed by the Crown Zellerbach Corp. at Camas; it carries dilute sulfite waste liquor to midstream of the Columbia River where the water flow is consistently large and rapid; this system was placed in operation at the beginning of 1951. The sulfite waste liquor from the Soundview Pulp Co. and the Weyerhaeuser Timber Co. at Everett will be carried 3000 feet from the shoreline; work is progressing rapidly on this project. 3 figures.
E.S.

EDLING, G. Thermotechnical problems in the manufacture of sulfite pulp. Das Papier 4, no. 23/24: 438-45 (December, 1950). [In German]

Following a brief discussion of heating problems in connection with the cooking and drying of strong sulfite pulp (using sprucewood and the calcium bisulfite process) in Sweden, the author deals with recent developments in the evaporation and combustion of sulfite waste liquor, including different evaporator hookups, the channel-switching system for preventing the deposit of incrusting substances, and methods of combustion of the liquor evaporated to 55% dry solids. The disposal of fly ash and sulfur trioxide and sulfur dioxide in the flue gases is mentioned briefly. Sweden is principally interested in the utilization of sulfite waste liquor as a means of

saving coal. However, the economics of sulfite waste liquor as a fuel are so complicated that no generally applicable rule can be made; each mill presents an individual problem and requires individual study. A heat-balance sheet for a strong sulfite mill which burns its waste liquor is included. 2 tables and 6 figures. E.S.

MANNBRO, NILS. Sulfite waste liquor as cooking liquor in the digestion of sulfate pulp. I and II. Svensk Papperstidn. 54, no. 1: 19-24; no. 2: 61-9 (Jan. 15, 31, 1951). [In Swedish; German and English summaries]

Following a survey of the known procedures for the utilization of sulfite waste liquor (I) in the sulfate process, a laboratory study of a new method, the Silfat method, is described. In this process, the soda smelt is added to sodium- or calcium-base (I), and the solution is causticized and used as a cooking liquor in sulfate pulping. In this manner the dry solids of (I) are included in the black liquor and are evaporated with the black liquor at no additional expense. A brief description is given of the analytical methods used in this study; one of the methods is also suitable for determining the sulfide in oxidized black liquor. The following results were obtained in a series of experimental cooks: When pure liquors are used, the Silfat process gives a somewhat higher yield at the same Roe number than the straight sulfate cook; the alkali consumption is higher, and a longer cooking period is required. The pulps have, in general, the same beating characteristics and strength properties. The sulfate soap, however, does not separate well from the Silfat black liquor. Similar results are obtained when black liquor is re-used in the cook. The problem of liquor preparation on a mill scale was studied at Hellefors Bruks A.B. in Fredriksberg, where the sulfite and sulfate processes are employed in adjacent mills; special attention was paid to calcium-base (I). It is first used for the washing of the lime mud and then mixed with fresh sludge (slurried in a small amount of green liquor) from the causticizer. The weak liquor thus obtained, after clarification, is fed to the smelt dissolver; an excess of this weak liquor can be mixed with the black liquor. Following the causticizing of this green liquor, settling of the sludge proceeds at a satisfactory rate because the calcium precipitate formed by (I) has previously been removed from the weak liquor. The amount of alkali in circulation in the Silfat process increases 30-35%, whereas the ratio of alkali to dry substance remains practically unchanged. The saving in fuel in a sulfate mill with an annual production of 30,000 metric tons is estimated at about 7500 tons of coal, provided that undiluted (I) is used. The sulfur content of (I) is largely present as sulfide in the soda liquor; it can be recovered as hydrogen sulfide, burned to sulfur dioxide, and recycled to the sulfite mill. A complementary method for the use of (I) in the prehydrolysis of sulfate chips is mentioned. Extensions to the recovery plant needed in the Silfat process could be avoided if semichemical sulfate pulp were made, or chemical products recovered from the black liquor by dry distillation, pressure heating, or lignin precipitation. Vanillin is also formed when (I) is treated with alkali at high temperatures. The essential features of the Silfat process have either been already patented or patent applications have been made. 1 table, 16 figures, and 44 references. E.S.

SULFUR

CHEMICAL CONSTRUCTION CORPORATION. New sulfur refining process competitive with Frasch. Chem. Eng. News 29, no. 7: 560 (Feb. 12, 1951); Chem. Inds. Week 68, no. 4: 20-1 (Feb. 10, 1951).

Chemical Construction Corp. has announced a new process for refining "low-grade" sulfur. At present the consumption of sulfur in the U. S. is exceeding production, and most of the world's supply of sulfur comes from the Gulf Coast. Here sulfur is recovered by the Frasch process which requires extensive, high-grade deposits of elemental sulfur. There are available throughout the world large deposits of sulfur to be mined from the surface, but no economic means of refining them has been available. It is claimed that by the new process any deposit can be utilized which has more than a 30% free sulfur content, and a 99.5% pure sulfur product can be produced for between $15 and $18 a ton, net cost at the mine. The recovery process is described, and designers of the plant claim 90% sulfur recovery. Since the equipment used is relatively simple, the capital cost of the installation is small, and under present conditions a 200-ton/day plant to process 35% ore would cost about $1.4 million and would pay for itself in four years. As a sulfuric acid producer the process compares favorably with a pyrites acid plant. M.W.

BONHAM, W. M. Canada's sulphur supplies. Pulp Paper Mag. Can. 52, no. 1 : 66-8 (January, 1951).

Although there is at present no known native sulfur deposit in Canada, an abundant supply in the form of pyrite is conveniently available in most parts of the Dominion. Until recent years the industries of the country required only a comparatively small tonnage, and the principal user, the paper industry, preferred imported native sulfur. The present rapid industrial expansion has increased the market for sulfur to a notable degree and has induced the smelter companies in the East to find means of turning their smoke and mill tailings into marketable sulfur. The smelters of Sudbury, Noranda, and Flin Flon discharged approximately 1,520,000 tons of sulfur into the atmosphere in 1949; the first two are installing equipment for sulfur recovery, whereas Flin Flon has no plans at present. Additional sources of sulfur are mentioned in the Goudreau area northeast of Lake Superior and the oil refineries on the prairies, for instance, Pincher Creek in southwest Alberta. Sulfuric acid is manufactured principally from smelter gas at the Trail smelter in British Columbia, where the Consolidated Mining and Smelting Co. has built up a large and profitable part of their business from waste gas. E.S.

TINKER, E. W. Sulphur requirements for wood pulp production. Tappi 34, no. 2 : 60A, 62A (February, 1951).

This is a text prepared by the Critical Materials Committee of the American Pulp and Paper Association which contains recommendations for an effective conservation and reclamation program governing the country's sulfur supplies. E.S.

VANILLIN

PEARL, IRWIN A., and BEYER, DONALD L. Reactions of vanillin and its derived compounds. XI. Cinnamic acids derived from vanillin and its related compounds. J. Org. Chem. 16, no. 2 : 216-20 (February, 1951) ; *cf.* B.I.P.C. 20 : 523.

A number of old and new substituted cinnamic acids have been prepared from vanillin and some of its related compounds by the Vorsatz modification of the Doebner reaction. The ethyl esters of these substituted cinnamic acids were prepared, and their inhibiting concentrations were determined for the representative micro-organisms *Aerobacter aerogenes, Bacillus mycoides, Aspergillus niger,* and *Penicillium glaucum.* The ultraviolet absorption spectra of these compounds have been determined. 1 table, 2 figures, and 10 references. E.S.

PEARL, IRWIN A., and BEYER, DONALD L. Reactions of vanillin and its derived compounds. XII. Benzyl methyl ketones derived from vanillin and its related compounds. J. Org. Chem. 16, no. 2: 221-4 (February, 1951).

Some old and new β-nitropropenylbenzenes and benzyl methyl ketones have been prepared from vanillin and some of its related compounds. The ultraviolet absorption spectra of these compounds have been determined. 2 tables, 1 figure, and 5 references. E.S.

PEARL, IRWIN A., and DICKEY, EDGAR E. Studies on lignin and related products. IV. Separation of syringaldehyde and vanillin by chromatography. J. Am. Chem. Soc. 73, no. 2: 863-4 (February, 1951); *cf.* B.I.P.C. 21: 119.

A method for the quantitative separation of syringaldehyde and vanillin by the use of chromatography is reported. An acid-washed Magnesol absorbent and a petroleum ether-ethanol developer were used. The colorless zones were located by five streak reagents which were applied with capillary-tipped pipets in a manner similar to the brush technique. Vanillin (m.p. 76-79°C.) and syringaldehyde (m.p. 108-110.5°) were recovered in yields of 99 and 98%, respectively. Single recrystallizations from water yielded vanillin (m.p. 81-82°) and syringaldehyde (m.p. 111-112°) which were identical with the original materials. 1 table and 8 footnotes. M.W.

WASTE PAPER

BAKER, COLLEY S. Waste paper situation. Paper Trade J. 132, no. 8: 98 (Feb. 23, 1951).

The greatly increased consumption of waste paper, which in the first three weeks of 1951 was exceeding the comparable period of last year by 35%, indicates that all-out efforts to collect waste paper will be required this year. The situation is especially serious because the waste paper-consuming mills in the East have the smallest January inventories in five years, both from the standpoint of tonnage and days of supply. Two measures are recommended for increasing the supply: (1) The public again must be impressed with the need for saving waste paper, and (2) supplemental collections must be set up throughout the country to augment the supplies produced by the waste paper industry from their established channels. Methods of carrying out these measures are suggested. M.W.

WATER-MARKS

SULLIVAN, FRANK. Little pitchers in the big years. Paper Maker [U. S.] 20, no. 1: 10-19 (1951).

Watermarks in the 16th century served primarily to decorate the paper and only accidentally to identify the papermaker. They followed a restricted imitative style within a limited set of traditional patterns. One of these, the water-pitcher design in Elizabethan England, is the subject of this article. The various forms in which the watermark appeared are illustrated, and some of the letters on which they were found are reproduced. M.W.

WET STRENGTH

WILFINGER, HUBERT. Urea resins in the paper industry. Textil-Rundschau 5, no. 12: 497-504 (December, 1950). [In German] *cf.* B.I.P.C. 21: 198-9.

The author reviews the use of urea-formaldehyde condensation products as adhesives and for improving the wet strength of paper, including a brief history of developments, requirements of wet-strength resins, properties of some commercial products, methods of application, necessary precautions, and a short discussion of the possible causes of the wet-strengthening effect. In conclusion, the suitability of polyethylenimine, urea, and melamine resins for different purposes and use requirements is described. 4 tables, 2 figures, and 13 references. E.S.

WETTING-OUT AGENTS

HART, JOHN A., and LEE, EDWARD W. A new color reaction of cationic soaps and its application to studies of their interactions with cellulose fibers. Tappi 34, no. 2: 77-9 (February, 1951).

A new color reaction of alkaline earth metal lakes of the dyestuff Eriochrome azurol B with cationic soaps is described. The reaction was found to provide a very sensitive means of determining cationic soaps in dilutions as great as 0.1 p.p.m. The adsorption of cationic soaps on cellulose fibers of varying degree of purity and mechanical refinement has been measured, and the data are discussed. The dyestuff is shown to serve as a good indicator in the determination of anionic soaps by titration with cationic soaps. 1 table, 4 figures, and 2 references. E.S.

WOOD—CHEMISTRY

WACEK, A. VON, and SCHROTH, D. Studies on the lignin-carbohydrate linkage. Das Papier 4, no. 21/22: 410-14 (November, 1950). [In German]

In the course of a quantitative analysis of a tropical wood (*Entandrophragma utile*) it was found from a methoxyl balance that all the methoxyl belongs to the lignin, as obtained in a Halse lignin determination, or to other aromatic substances related to lignin. From the alkali extract of the holocellulose isolated after two treatments of the wood with sodium chlorite according to Jayme (*cf.* B.I.P.C. 13: 136), a substance is obtained in about 6% yield, based on the original, extractive-free wood. This substance is soluble in alcohol and contains 16.5% methoxyl and 7.3% carboxyl; it forms an alkali salt which is insoluble in alcohol and which is not hydrolyzed by mineral acids to reducing sugars. On oxidation with nitrobenzene according to Freudenberg, vanillin, syringaldehyde, and syringic acid are obtained. The same substance, but with a lower methoxyl content (12.4%), because of the absence of the syringyl group, and a higher carboxyl content (9.7%) is also obtained from sprucewood. Oxidation with peracetic acid gives vanillin. The author discusses the possibility that this substance is chemically combined with the carbohydrates in wood. 3 tables and 18 footnotes. F.E.B.

WOOD ROOM

ANON. Modern wood plant for Inland Empire Paper Co. Pulp & Paper 24, no. 12: 85-6, 88, 90 (November, 1950).

The layout of the new wood-preparation plant of the Inland Empire Paper Co. near Spokane, Wash. is described briefly. It is built of concrete and steel and includes a Worthington Hydrobarker and a 110-inch whole-log chipper. 9 illustrations. E.S.

WOOD TRANSPORTATION

CANADIAN PULP AND PAPER ASSOCIATION. *Woodlands Section.* Mechanical hauling Field Meeting, Heron Bay, Ontario, Oct. 12-

13, 1950. Pulp Paper Mag. Can. 52, no. 1: 96, 98-9, 101-2, 105-6, 109-11 (January, 1951).

The following papers were presented, listed here by authors and titles: Thompson, Bruce. Sloop hauling in relation to forest management, p. 96, 98; McColl, B. J. Problems in mechanical hauling from the stump—1 table and 3 figures, p. 99, 101-2, 105-6; Montgomery, R. H. Farm tractor haul, p. 109-10; McNally, J. A. Farm tractor sloop hauling, p. 110; and Atkinson, C. C. Yarding of 4-foot sap peeled pulpwood with Ford wheeled tractor with Bombardier track conversion, p. 111. E.S.

GLIDDEN, CLAUDE. Floating log flume. Pulp Paper Mag. Can. 52, no. 1: 94-5, 106 (January, 1951).

The use of a floating log flume is described for directing sawlogs and pulpwood floating down the Ottawa River into the logslide at the 60-foot drop in the river created by the dam at the Bryson hydroelectric plant. Prior to this installation the swift water current caused many logs to escape into the intake canal or the racks at the power house, from where they had to be removed. The operation of the flume during the 1950 logging season has been very satisfactory; the capital outlay was much less than that required by alternative schemes. 1 map and 4 illustrations. E.S.

WOOD WASTE

CARPENTER, ROSWELL D. Amount of chippable waste at southern pine sawmills. Southern Forest Experiment Station. Occasional Paper 115: 1-7 (November, 1950); Wood 6, no. 2: 20, 38-9 (February, 1951).

The results of a study of the amount of wood waste, suitable for pulp chips, produced at four different classes of southern pine sawmills are summarized. The study was made co-operatively by the Southern Kraft Division of the International Paper Co. and the Southern Forest Experiment Station. The mills were classed according to their sawing equipment as follows: class 1—band headsaw with resaw; class 2—solid-tooth circular head saw with resaw and shotgun carriage feed; class 3—solid-tooth circular headsaw with steam feed (small gun), no resaw; and class 4—portable mill with circular headsaw using inserted bits, no resaw. There were four mills in each class, two in Arkansas and two in Louisiana. Most of the study logs were loblolly and shortleaf pine from second-growth timber. The average log length was 16 ft., and the diameters ranged from 6 to 23 in. The volume of chippable waste/1000 board feet was 0.43 cord for class 1, 0.46 cord for class 2, and 0.61 cord for classes 3 and 4. The main factor in determining the amount of waste proved to be the diameter of the logs; the waste varied inversely with the diameter. For most diameter groups, class-2 mills produced less waste than mills of other classes. The steps involved in calculating the waste at other mills which cut southern pine timber are enumerated. 5 tables and 1 figure in the first reference. M.W.

KING, F. W., and BENDER, F. Production of insulating fibreboard from western red cedar shingle mill waste. Pulp Paper Mag. Can. 52, no. 1: 75-9 (January, 1951).

The manufacture of cedar shingles is a major industry in British Columbia, which results in more than 50% of a heterogeneous waste consisting of approximately 53% so-called shingle hay and sawdust, 27% wood, and 20% fibrous bark. The authors describe laboratory experiments for the production of insulating board from this waste, including chipping, steaming, and refin-

ing in a Sprout-Waldron disk attrition mill of the individual components; none of the resulting pulps received any screening treatment. The three pulps were mixed in the requisite amounts, and their consistency was adjusted to 1% by the addition of water. The sizing operation required an initial neutralization with sodium carbonate on account of the acidic nature of the stock; the sized stock was placed into a Williams sheet machine, the resulting mats were transferred to a hydraulic press, and then to a drying oven. The A.S.T.M. Designation C 208-48 was used for evaluating the experimental boards. The results indicate that acceptable insulating fiberboard of the Class A and C can be produced from the shingle mill waste, the better grades with the lowest fraction of the shingle-hay and sawdust component. The latter can be readily separated from the rest of the mixture on account of its physical nature and used as fuel, for which purpose a certain amount of the material is needed in any case. 1 table, 4 figures, and 3 references. E.S.

Patent Section

Although the abstracts of the United States and Canadian patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and the* Canadian Patent Office Record *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies, and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. With January, 1949, printed copies of Canadian patents are available at 25 cents per copy of less than 50 sheets of printed matter. For patents of 50 sheets or over, the price is $1.00 per copy. Beginning with volume 21, the Canadian patents will be abstracted from the complete specifications.

ALKALINE PROCESSES

BRIGGS, BEN T. Wood pulp digestion. Canadian patent 471,679. Filed April 15, 1947. Issued Feb. 20, 1951. 4 claims. Assigned to Rayonier Incorporated.

A process for the preparation of chemical wood pulp from wood chips involves the following steps: (1) a steam pretreatment at a temperature of 140-200°C. in the absence of any free liquid, and (2) an alkaline cook under conditions essentially normal for a one-stage alkaline cook. E.G.S.

BARKERS AND BARKING

PIISPANEN, VAINO. Log debarking devices. Canadian patent 471,134. Filed June 12, 1948. Issued Jan. 30, 1951. 5 claims.

A barker comprises a rotary carrier which has an opening for the passage of a log, a support for the carrier, a bark peeler which extends through the opening and which is secured to the carrier at one end, a holder for the other end of the peeler which is pivotally connected to the carrier, and a pneumatic extender which acts against the holder to hold the peeler against the log. Thus the contact of the peeler with the log is assured, regardless of the contour of the log. 3 figures. E.G.S.

POWER, MICHAEL J. Outfeeding mechanism for portable debarking machines. U. S. patent 2,543,128. Filed Feb. 7, 1947. Issued Feb. 27, 1951. 6 claims. Assigned to Nekoosa Foundry and Machine Works, Inc. [Cl. 144-247]

This is the same as Canadian patent 453,017; *cf.* B.I.P.C. 19: 364. E.G.S.

SWIFT, FRANK H., and DODSON, GUY R. Hydraulic log barker with self-lubricating sealing means. U. S. patent 2,542,371. Filed April 8, 1946. Issued Feb. 20, 1951. 4 claims. Assigned to Crown Zellerbach Corporation. [Cl. 144-208]

A seal which is adapted for use in hydraulic barkers is lubricated by the same water that is employed for barking purposes; means are included for the accurate adjustment of the quantity of water used for lubrication. 6 figures. E.G.S.

BLEACHING

MARTIN, MERVIN E., and UMANSKY, MORRIS. Cellulose purification. Canadian patent 471,695. Filed July 12, 1948. Issued Feb. 20, 1951. 10 claims. Assigned to Camille Dreyfus.

This is the same as U. S. patent 2,482,858; *cf.* B.I.P.C. 20: 136. E.G.S.

BOARD

FAHRNI, FRED. Apparatus for applying adhesive to a mass of wood chips. U. S. patent 2,542,804. Filed Jan. 9, 1948. Issued Feb. 20, 1951. 9 claims. [Cl. 91-50]

An apparatus is designed for the application of an adhesive to a mass of wood chips and shavings in the manufacture of pressed board. The invention embodies a hopper and an adhesive-applying roll or drum, to which adhesive is applied in a thin film, and from which it is taken up by the chips and other material, which are alternately tumbled in the hopper and pressed into firm contact with the adhesive. 9 figures. E.G.S.

GOSS, WORTH C. Method of pressing sheet lumber. U. S. patent 2,542,025. Filed July 1, 1946. Issued Feb. 20, 1951. 6 claims. Assigned to Edward S. Heller. [Cl. 18-47.5]

A method is described for the manufacture of sheet lumber with one smooth surface, densely welded surface layers, and a less dense body between the layers. A moist mixture of lignocellulosic fibers (e.g., wood chips or other wood waste materials) and a bonding agent is formed into a matted pad; the pad is compressed into a rigid sheet between heated platens, one of which is smooth and the other of which is steam vented over its pressing surface. The smooth platen is heated to such a temperature that a quick welding of the fibers adjacent to the platen is effected, and a dense surface layer is formed; the other platen is heated to a substantially higher temperature to counteract the cooling effect of escaping steam, and to form a dense surface layer of like thickness on that side of the sheet. 4 figures. E.G.S.

TOWER, GORDON E. Processes of forming boards or the like and products. Canadian patent 471,302. Filed June 12, 1948. Issued Feb. 6, 1951. 19 claims. Assigned to Chapman Forest Utilization, Inc.

A method is provided for the manufacture of a fiberboard which has increased strength, modulus of rupture, resistance to moisture absorption, resistance to swelling or warping, and resistance to the effects of acids, alkalies, steam, heat, dry rot, and fungus, or to destruction by termites and rodents. Wood or woody substances are reduced to fibers, and the fibers are mixed with water to form a slurry. An alkaline solution of a thermosetting phenol-formaldehyde intermediate condensation product (3.5% resin solids, based on the dry weight of the fibers) is mixed into the slurry, and the resin is allowed to remain in solution in the slurry for at least 0.5 hour to establish the sorption of the resin solution by the fibers. The mixture is subsequently neutralized to precipitate the resin *in situ*, and the slurry is drained to form a mat of entangled, resin-bearing fibers. The mat is subjected to heat and pressure to

form a consolidated product of fibers and an infusible, insoluble phenol-formaldehyde resin. E.G.S.

BOARD SPECIALTIES

BEUKELMAN, HENRY. Florist's pack and jacket for the same. U. S. patent 2,540,707. Filed Oct. 30, 1945. Issued Feb. 6, 1951. 6 claims. [Cl. 229-21]

A flower pot jacket is constructed of bendable, water-resistant cardboard stock; the jacket comprises a side wall member, the ends of which are interlocked, and a bottom member, the marginal portions of which are bent upwardly and attached to the lower part of the side wall member. 7 figures. E.G.S.

DERMAN, HARRY. Knockdown chest. U. S. patent 2,539,658. Filed Feb. 7, 1946. Issued Jan. 30, 1951. 10 claims. [Cl. 229-23]

A reinforced corrugated chest is adapted for storage of children's toys and is sufficiently strong to withstand the weight of one or two children when used as a bench. 8 figures. E.G.S.

FETTINGER, JOHN G. Display stand. U. S. patent 2,541,754. Filed April 30, 1947. Issued Feb. 13, 1951. 5 claims. Assigned to Robert Gair Company, Inc. [Cl. 206-45.11]

A cardboard, paperboard, or corrugated board combination shipping container and display stand comprises separate box sections which are joined in such a manner that they may be folded together for shipment or opened to serve as a display stand. 5 figures. E.G.S.

JUBIN, JOSEPH E. Collapsible hat anchor. U. S. patent 2,542,815. Filed Aug. 30, 1948. Issued Feb. 20, 1951. 6 claims. Assigned to Huye Space Saving Box System Inc. [Cl. 206-9]

A collapsible cardboard hat stay is adapted for placement in a hatbox to center a hat immovably during handling and shipment; the hat is maintained out of contact with the sides and top of the box, and thus the crushing of the crown or brim is avoided. 6 figures. E.G.S.

KOHL, WILLIAM R., and IVERSON, ARDEN L. Garment hanger shield. U. S. patent 2,535,685. Filed Dec. 20, 1946. Issued Dec. 26, 1950. 4 claims. Assigned to Para-Lux Products Company. [Cl. 223-88]

A paperboard shield is adapted to be mounted on a wire garment hanger in such a manner that the shield is effectively centered and supported on the hanger, and that its accidental displacement in use is prevented. 4 figures. E.G.S.

LEBOLD, SAMUEL N. Handle for bottle carriers. U. S. patent 2,543,698. Filed June 14, 1946. Issued Feb. 27, 1951. 4 claims. Assigned to Morris Paper Mills. [Cl. 224-45; changed to 224-48]

A removable, sling-type paperboard handle for multicompartment bottle carriers can be retracted to an inoperative position below the level of the bottle tops. 7 figures. E.G.S.

LIGHTER, STEPHEN. Bottle carrier. U. S. patent 2,535,741. Filed Oct. 28, 1946. Issued Dec. 26, 1950. 5 claims. [Cl. 229-28]

A multicompartment cardboard bottle carrier incorporates a carrying

handle which can be folded out of the way to permit the filled carriers to be stacked upon one another without the interference of the handle. 9 figures. E.G.S.

MAGILL, DONALD G. Method of producing fiber tubing. U. S. patent 2,539,450. Filed Nov. 21, 1946. Issued Jan. 30, 1951. 6 claims. Assigned to American Can Company. [Cl. 93-80]

This corresponds to Canadian patent 466,288; *cf.* B.I.P.C. 20: 919. E.G.S.

PUTNAM, LOUIS S., and KELLY, HAROLD C. Tissue dispensing packages. Canadian patent 471,166. Filed June 5, 1948. Issued Jan. 30, 1951. 1 claim. Assigned to Dow Corning Corporation.

A book match-type package is provided which contains a stack of tissue and a resilient sheet which is positioned between the tissue and the secured end of the cover. The flanged end of the cover, the resilient sheet, the stack of tissue, and the back of the cover are secured together by staples at a point spaced from the edge of the flanged end of the cover. Thus a pocket is provided in which the free end of the cover may be positioned without interference with the tissues. 2 figures. E.G.S.

WEISS, ARTHUR J. Container carriers. Canadian patent 471,648. Filed Nov. 1, 1947. Issued Feb. 20, 1951. 18 claims. Assigned to Robert Gair Company, Inc.

A multicompartment cardboard bottle carrier is constructed in such a manner that the grain of the cardboard runs vertically through the handle section, then horizontally to the side sections, and finally down to the base or bottle-carrying section; thus the maximum strength of the cardboard is utilized. 28 figures. E.G.S.

WILLIAMSON, MARSHALL I. Bottle carrier. U. S. patent 2,540,066. Filed March 30, 1949. Issued Jan. 30, 1951. 6 claims. Assigned to National Folding Box Company, Inc. [Cl. 224-45; changed to 224-48]

The body portion of a paperboard carrier for bottles, cans, jars, or similar articles engages the bottles underneath the neck portion at approximately the area of greatest diameter, so that bottles of adjacent carriers, as well as the bottles within each carrier, are protected against glass-to-glass contact. 13 figures. E.G.S.

WILLIAMSON, MARSHALL I. Carrier for bottles, cans, or similar articles. U. S. patent 2,540,065. Filed March 30, 1949. Issued Jan. 30, 1951. 6 claims. Assigned to National Folding Box Company, Inc. [Cl. 224-45; changed to 224-48]

A paperboard carrier for bottles, cans, jars, and the like is equipped with a wire handle and is adapted to engage the bottles in such a manner that bottles in adjacent carriers or within any one carrier are protected against glass-to-glass contact. 8 figures. E.G.S.

WILLIAMSON, MARSHALL I. Carrier for bottles, cans, or similar articles. U. S. patent 2,540,067. Filed March 30, 1949. Issued Jan. 30, 1951. 9 claims. Assigned to National Folding Box Company, Inc. [Cl. 224-45; changed to 224-48]

A paperboard carrier for bottles, cans, jars, and the like is resistant to

distortion and is adapted for automatic loading on established types of loading machinery now used for the handling of partitioned wooden and metal cases. 8 figures. E.G.S.

ZIEMMERMAN, HENRY. Cornice. U. S. patent 2,539,380. Filed March 20, 1946. Issued Jan. 23, 1951. 7 claims. Assigned to Chicago Cardboard Company. [Cl. 160-39]

A cardboard cornice is adapted for the support of rods and curtains at a window or doorway. 12 figures. E.G.S.

CELLULOSE ETHERS

REEVES, RICHARD E. Production of improved cellulosic materials. U. S. patent 2,520,963. Filed June 6, 1947. Issued Sept. 5, 1950. 6 claims. Assigned to the United States of America as represented by the Secretary of Agriculture. [Cl. 260-212]

A method is described for the production of cellulose which exhibits an improved resistance to attack by chemical reagents, especially alkalies. As an example, 30 grams of commercially purified wood pulp are treated in an autoclave with 490 ml. of methanol containing 2% of hydrochloric acid for one hour at 120°C. For purposes of comparison, 30 grams of the same material are mercerized by treatment with 300 ml. of 18% aqueous sodium hydroxide at room temperature for 0.5 hour. Both samples are washed free of acid with alcohol and are air dried. The cuprammonium fluidity (0.5% cellulose concentration) and the weight loss on alcoholysis are 24.5 rhes and 2.6%, respectively, for the purified wood pulp, and 38.9 rhes and 2.8%, respectively, for the mercerized pulp. 2 figures. E.G.S.

SMITH, FREDERICK W. Method of making carboxymethylcellulose of improved soil suspending properties. U. S. patent 2,542,215. Filed July 30, 1949. Issued Feb. 20, 1951. 7 claims. Assigned to Wyandotte Chemicals Corporation. [Cl. 260-231]

Sodium carboxymethylcellulose is used as an additive to enhance the washing and detergent properties of washing solutions. As an example, 500 grams of sheet cellulose are placed in a shredding machine, and 712 grams of 35% sodium hydroxide are added over a period of 0.5 hour; the cellulose and caustic are then worked in the shredder for one hour. Then 355 grams of a 78% monochloroacetic acid solution are added over a period of one hour, and the shredding operation is continued for an additional two hours. Thereupon the sodium carboxymethylcellulose product is discharged from the shredding machine, and upon analysis is found to have a moisture content of 37.6%. The whiteness retention value of this product, after drying and testing (according to a standard soiling procedure and reflectance measurement), is found to be 41.4%. 2 figures. E.G.S.

CHIPS

KANTO, NIILO. Methods of quality sorting of cellulose and other chips. Canadian patent 471,449. Filed Nov. 13, 1947. Issued Feb. 6, 1951. 9 claims. Assigned to John S. Bates.

A method is described for the sorting of wood chips into two or more quality groups. The chips are caused to slide down an inclined surface (constructed, e.g., of wood, iron, acid-resistant steel, aluminum, copper, or concrete). The various types of chips attain different speeds because of differences in frictional resistance between the chips and the inclined surface; the knots are thrown farthest from the end of the inclined surface, the marrow

(sapwood?) chips land next to the knots, then the wet chips, then the first-quality chips, and so on. A current of air may be directed against the inclined surface to diminish or accelerate the speed of the chips. 3 figures. E.G.S.

CHLORINE

JOHNSON, AVA J., and CHERNIAVSKY, ALEXANDER J. Chlorine production. U. S. patent 2,542,961. Filed Nov. 8, 1948. Issued Feb. 20, 1951. 3 claims. Assigned to Shell Development Company. [Cl. 23-219]

Chlorine is produced by the reaction of hydrogen chloride with oxygen in the presence of a fluidized alumina-copper chloride catalyst. 1 figure. E.G.S.

CLAY

MILLMAN, NATHAN, and WHITLEY, JAMES B. Treating clay. U. S. patent 2,535,647. Filed June 14, 1947. Issued Dec. 26, 1950. 6 claims. Assigned to J. M. Huber Corporation. [Cl. 106-72]

A method of treating clay to improve its processing properties comprises the steps of preparing a mixture of 115-210 volumes of clay (composed principally of kaolinite), 100 volumes of water, and 0.05-1% of a peptizing agent (based on the weight of the clay), and kneading the mixture at such a rate that the temperature of the mixture rises 5°C. in five minutes and until the temperature has been elevated at least 5°. The proportions of clay and water are previously adjusted so that upon kneading, the mixture becomes plastic within five minutes. 4 figures. E.G.S.

CORES

TIDLAND, EDWARD H. Expansible winder shaft. U. S. patent 2,537,492. Filed July 26, 1949. Issued Jan. 9, 1951. 5 claims. [Cl. 242-72] *cf.* B.I.P.C. 21 : 129.

An expansible winder shaft is adapted to be expanded pneumatically and to be contracted quickly by the deflation of a rubber tube within the shaft. 7 figures. E.G.S.

DIELECTRICS

SPROULL, REAVIS C., and STAATS, PHILIP L. Glass fiber sheet material. Canadian patent 471,000. Filed Dec. 12, 1945. Issued Jan. 23, 1951. 3 claims. Assigned to Canadian General Electric Company, Limited.

This corresponds to U. S. patent 2,504,744; *cf.* B.I.P.C. 20: 680. E.G.S.

DIGESTERS

DE LA ROZA, JOAQUIN J., SR. Continuous digestion apparatus for the production of highly purified cellulose. U. S. patent 2,542,801. Filed April 12, 1945. Issued Feb. 20, 1951. 4 claims. [Cl. 92-7; changed to 92-11]

An apparatus is adapted for the continuous digestion of a cellulosic raw material to recover a highly purified cellulose. The invention includes successive digesters which comprise inclined concentric vessels (the inner one rotary, the outer stationary) and an internal open screw which is affixed to the inner wall of the rotary vessel; the volume of the inner vessel, the rate of rotation, the pitch of the screw, and the angle of inclination of the digesters determine the length of the digestion period. 2 figures. E.G.S.

DISPENSING CONTAINERS

CARTWRIGHT, ROBERT B. Dispensing container. U. S. patent 2,540,321. Filed June 28, 1947. Issued Feb. 6, 1951. 4 claims. [Cl. 229-7]

A portion of a paperboard cereal carton is constructed and arranged in such a manner that it lies adjacent to the top wall of the box; in one position the said portion co-operates with the top wall to form a closure, and in another position it forms a pouring spout. 9 figures. E.G.S.

CHEMLINSKI, RAYMOND. Dispensing container for matches. U. S. patent 2,542,180. Filed June 8, 1945. Issued Feb. 20, 1951. 2 claims. [Cl. 206-56; changed to 229-17]

A cardboard dispensing container for matches, toothpicks, pencils, and the like is constructed in such a manner that two triangular edge sections can be removed to provide access to the merchandise. 8 figures. E.G.S.

NYDEN, ROBERT, and DICKERMAN, HARRY K. Metal closure for powder cans. U. S. patent 2,538,946. Filed July 6, 1945. Issued Jan. 23, 1951. 1 claim. Assigned to F. N. Burt Company, Inc. [Cl. 229-5.5]

A metal closure for a cardboard dispensing container (e.g., for toilet or cosmetic powder) incorporates a reinforcing metal terminal piece or ring which is crimped or attached to the wall of the can; a closure plate or member which has a peripheral depending skirt flange is received with a tight friction fit within the reinforcing terminal piece, thus providing a siftproof joint with the body of the can. 5 figures. E.G.S.

VOOS, FREDERICK A. Pull-tape dispensing device. U. S. patent 2,543,681. Filed Sept. 8, 1949. Issued Feb. 27, 1951. 2 claims. [Cl. 206-16]

A cardboard, plastic, or metal container for razor blades incorporates a pull-tape dispensing device, by means of which the packaged blades can be ejected individually in succession. 4 figures. E.G.S.

EVAPORATION AND EVAPORATORS

GADRET, RENÉ H. Process for the treatment of waste liquors derived from cellulose manufacture. U. S. patent 2,535,730. Filed Sept. 28, 1948. Issued Dec. 26, 1950. 5 claims. Assigned one half to Papeteries de Gascogne (Société Anonyme). [Cl. 23-48]

A process is described for the evaporation of black liquor. By the atomization of black liquor under pressure, a very fine suspension is formed in space in an unobstructed chamber where the temperature is 280-300°C.; a quantity of air which is insufficient to ensure complete combustion of the liquor components is introduced into the chamber in the vicinity of the spray jets. The almost instantaneous evaporation of the water in the minute particles of black liquor in the region of the air inlet is followed by a partial combustion which serves to maintain the operating temperature; a gasification of the unburned organic components also takes place. The inorganic components eventually separate and collect on the bottom of the chamber in an unmelted condition. All these phenomena occur before any contact is made with the walls or other surfaces of the chamber. Exit gases from the chamber may be burned in a fresh supply of air in a separate heat-generating chamber. 3 figures. E.G.S.

EVAPORATION AND EVAPORATORS—SULFITE WASTE LIQUOR

LOCKMAN, CARL J. Heat exchange apparatus and methods of operating same. Canadian patent 471,620. Filed April 20, 1948. Issued Feb. 20, 1951. 9 claims. Assigned to Aktiebolaget Rosenblads Patenter; *cf.* B.I.P.C. 20:757.

A plate-type heat exchanger includes means for interchanging the paths of flow of steam and a scale-forming liquid; any scale that is deposited from the liquid onto the walls of either fluid passage during a given period is substantially removed by the dissolving action of the steam and its condensate when they are passed through the same passage during the next period. 1 figure. E.G.S.

FILTERING SPECIALTIES

ANDERSON, LOUIS E. Filter element and method of making the same. U. S. patent 2,539,768. Filed May 5, 1947. Issued Jan. 30, 1951. 7 claims. Assigned to The Cuno Engineering Corporation. [Cl. 210-204]

A method is described for the manufacture of a filter element by the accretion of resin-impregnated fibers (principally wool, together with up to 40% by weight of esparto, yucca, or other fibers) to produce a carcass of progressively increasing porosity toward the outer surface. Heated air is passed through the filter element to dry the resin-impregnated fibers and to set and cure the resinous material. The element is intended for use in the filtration of liquids and gases which are caused to flow radially inwardly under a differential pressure. 8 figures. E.G.S.

ANDERSON, LOUIS E. Method of making a filter element. U. S. patent 2,539,767. Filed May 5, 1947. Issued Jan. 30, 1951. 6 claims. Assigned to The Cuno Engineering Corporation. [Cl. 92-57]

A method is provided for the manufacture of thick-walled tubular filter elements by an accretion operation, in accordance with which a roughly cylindrical carcass of fibrous material is built up and then trimmed to substantially cylindrical form by a rotating jet of liquid which is directed against the carcass. Wool fibers constitute the principal fibrous material employed in making the elements; in addition, up to 40% by weight of other fibers (e.g., esparto, yucca, asbestos, and the like) are used. 4 figures. E.G.S.

FOLDING BOXES

BERMAN, OSCAR A. Foldable carton. U. S. patent 2,543,275. Filed April 4, 1949. Issued Feb. 27, 1951. 9 claims. [Cl. 206-7]

A foldable paperboard carton for suits, dresses, coats, and the like incorporates an integral carrying handle; a reinforced bottom construction serves to prevent the bulging of the carton under the weight of the contents. 11 figures. E.G.S.

FETTINGER, JOHN G. Cartons and display baskets. Canadian patent 471,330. Filed March 11, 1948. Issued Feb. 6, 1951. 5 claims. Assigned to Gair Company of Canada Limited.

This is the same as U. S. patent 2,505,034; *cf.* B.I.P.C. 20:681. E.G.S.

FUERST, EDWIN W. Toothbrush carton. U. S. patent 2,541,510. Filed Feb. 24, 1947. Issued Feb. 13, 1951. 6 claims. Assigned to Owens Brush Company. [Cl. 206-45.19]

A cellophane-wrapped, open-side cardboard carton is adapted for the packaging of toothbrushes or other small brushes. 6 figures. E.G.S.

GARIEPY, JOSEPH. Carton. U. S. patent 2,542,504. Filed March 1, 1949. Issued Feb. 20, 1951. 2 claims. [Cl. 229-28]

A multicompartment cardboard carton is adapted for the packaging of small fragile articles, such as eggs, Christmas tree ornaments, and the like. 10 figures. E.G.S.

HICKIN, ROBERT J. Cartons. Canadian patent 471,411. Filed April 26, 1950. Issued Feb. 6, 1951. 10 claims. Assigned to Somerville, Limited.

The locking tongues or hooks of a corner lock-type carton are formed in such a manner that the tendency for the tongues to tear away from their flaps is avoided; this advantage is accomplished by the formation of curved, rather than sharp, apexes of the angles which define the areas where the tongues are joined to their flaps. 3 figures. E.G.S.

HUTCHINSON, JOHN R. Foldable viewer. U. S. patent 2,543,240. Filed Jan. 16, 1948. Issued Feb. 27, 1951. 9 claims. [Cl. 40-28]

A paperboard shadow box-type viewer which is equipped with a magnifying lens accommodates either 16- or 35-mm. slides. 10 figures. E.G.S.

LANE, LOUIS I. Folded blank container for cigarettes and the like. U. S. patent 2,541,258. Filed Sept. 2, 1948. Issued Feb. 13, 1951. 3 claims. [Cl. 229-27]

A dual-compartment container for cigarettes, cigars, or candy is formed from a single sheet of cardboard. 5 figures. E.G.S.

MOORE, DAVID J. Food container. U. S. patent 2,540,342. Filed June 4, 1946. Issued Feb. 6, 1951. 3 claims. [Cl. 229-23]

A paperboard container for oleomargarine includes a partition member which serves to divide a conventional one-pound carton into half-pound molds for the colored margarine. 7 figures. E.G.S.

WAUDA, GEORGE E. Cartons. Canadian patent 471,536. Filed March 25, 1950. Issued Feb. 13, 1951. 2 claims. Assigned to Marathon Corporation.

This is the same as U. S. patent 2,527,167; *cf.* B.I.P.C. 21:285. E.G.S.

WILLIAMSON, MARSHALL I., and CARRUTH, HERMAN A. Sealed container with hinged cover. U. S. patent 2,543,084. Filed Sept. 19, 1945. Issued Feb. 27, 1951. 7 claims. Assigned to National Folding Box Company, Incorporated. [Cl. 229-45]

A hinged-cover paperboard container comprises a self-contained box part with sealable end walls and a hinged cover part which is adapted to telescope over one end of the box portion and enclose one of the sealable end walls therein; the cover part and the enclosed end wall incorporate co-operating abutment elements which are designed to resist the opening of the cover part. 36 figures. E.G.S.

FOLDING BOXES, SIFTPROOF

WEISS, ARTHUR J. Cartons and carton blanks. Canadian patent

471,329. Filed Dec. 22, 1947. Issued Feb. 6, 1951. 7 claims. Assigned to Gair Company of Canada Limited.

A paperboard carton for the packaging of cereals, flour, crackers, soap powders and flakes, and the like is constructed in such a manner that a tight seal is obtained at the top-end flaps and sifting is reduced. A satisfactory seal is effected even when slight inaccuracies occur in setting up the packaging machinery. 4 figures. E.G.S.

INSULATION AND INSULATING MATERIALS

HERITAGE, CLARK C., and WALTER, HENRY E. Manufacture of dry pressed felt. Canadian patent 471,433. Filed Nov. 24, 1943. Issued Feb. 6, 1951. 7 claims. Assigned to Wood Conversion Company.

A method is described for the manufacture of wood-fiber insulating blankets. For example, dry sulfite fibers are blown into a depositing chamber, and an 8.9% aqueous solution of a suitable phenol-aldehyde resin is also sprayed into the chamber, using 25.6 parts of resin solids per 100 parts of dry fiber. The moist deposited pile of fibers is roughly 4 inches high and has an average density of 0.49 lb./cu. ft. (based on the total dry material). The pile is wet-compressed to a height of about 1⅝ inches and a total dry material density of 1.22 lb./cu. ft. The compressed mat springs back to a height of about 2 inches and a density of 0.99 lb./cu. ft. The mat is then dried in an oven at 255°F., thus setting the resin binder. The dry bound mat is passed between compressing rolls which are adjusted to reduce the thickness to ⅜ inch; on leaving the rolls, the mat expands to a thickness of 1.24 inches and a density of 1.59 lb./cu. ft. The mat, after soaking and while wet, has a tensile strength of 440 lb./sq. ft.; on drying it recovers tensile strength to a value of 632 lb./sq. ft. 1 figure. E.G.S.

LIGNIN

HERITAGE, CLARK C., and VAN BECKUM, WILLIAM G. Process for producing lignin products. U. S. patent 2,541,059. Filed June 17, 1948. Issued Feb. 13, 1951. 8 claims. Assigned to Weyerhaeuser Timber Company. [Cl. 260-124]

A process is adapted for the manufacture of lignin products from lignocellulosic materials (e.g., wood, cornstalks, straw, bagasse, flax shives, hemp, and the like). The method is particularly applicable to the woods of aspen, jack pine, western larch, Douglas-fir, and western red-cedar. As an example, Asplund western red-cedar fiber is extracted with sodium hydroxide, and the extract is concentrated in the same manner as in U. S. patent 2,541,127, issued to Van Beckum; *cf.* B.I.P.C. 21: 525-6. The resulting concentrated extract is filtered to separate a lignin fraction, which is boiled in water to further separate it into water-insoluble and water-soluble fractions. The insoluble portion is removed by filtration, dried, and thus made available for utilization in various applications. The neutral, aqueous solution is subjected to varying procedures in order to obtain a lignin product in any one of several forms. 1 figure. E.G.S.

HERITAGE, CLARK C., and VAN BECKUM, WILLIAM G. Processing of lignocellulose materials. U. S. patent 2,541,058. Filed June 16, 1948. Issued Feb. 13, 1951. 25 claims. Assigned to Wood Conversion Company. [Cl. 260-124]

Comminuted lignocellulosic material (e.g., aspen, jack pine, western larch,

Douglas-fir, western red-cedar, and others) is processed to yield a fibrous product and a chemical product. The method comprises the steps of treating the fibrous raw material with a 0.6% aqueous sodium hydroxide solution at 20-140°C.; extracting the water-soluble reaction products in the alkaline solution with an aqueous solvent; separating the resulting solution to leave an extracted fibrous residue as one product; adjusting the pH of the aqueous solution from 7 to about 1.5 by adding sulfuric acid, thus increasing the sodium sulfate concentration and, as a result, precipitating a lignin material; and separating the lignin as a second product. 2 figures. E.G.S.

MACHINERY—BEATERS

HÉRY, EDOUARD, and THORSEN, KRISTEN A. Engines for beating and refining paper pulp. Canadian patent 471,112. Filed May 26, 1948. Issued Jan. 30, 1951. 6 claims.

A beater comprises the following essential parts: a horizontal high-speed drum on which knives are mounted (15 mm. high and 15 mm. apart); a bed plate which incorporates co-operating knives; and a pulp reservoir which extends laterally along the drum, the lower portion of which includes a delivery port for supplying pulp to the drum. 4 figures. E.G.S.

MACHINERY—CONSISTENCY REGULATORS

STAEGE, STEPHEN A. Papermaking machine and control therefor. U. S. patent 2,540,301. Filed July 30, 1945. Issued Feb. 6, 1951. 8 claims. Assigned to The Black-Clawson Company. [Cl. 92-43]

This corresponds to Canadian patent 454,378; *cf.* B.I.P.C. 19: 517. E.G.S.

MACHINERY—CONVERTING MACHINERY

AMBERG, STEPHEN W. Apparatus for rimming paper cups. U. S. patent 2,541,905. Filed Feb. 6, 1947. Issued Feb. 13, 1951. 4 claims. Assigned to Lily-Tulip Cup Corporation. [Cl. 93-36.5]

An apparatus is adapted for the formation of a rim on the mouth of a conical paper cup; the rims are uniformly and consistently formed, and the condition of the paper cup during the rimming operation is not critical. 6 figures. E.G.S.

BELCHER, DANIEL, WILLIAMS, RUSSELL J., and VOEGE, JAMES E. Apparatus for manufacturing valve bags. Canadian patent 471,285. Filed June 9, 1948. Issued Feb. 6, 1951. 38 claims. Assigned to Bemis Bro. Bag Company.

This is the same as U. S. patent 2,527,295; *cf.* B.I.P.C. 21: 285. E.G.S.

CONSER, HUGH F. Carton folding machine. U. S. patent 2,541,914. Filed May 14, 1945. Issued Feb. 13, 1951. 2 claims. Assigned to Shedd-Bartush Foods, Incorporated. [Cl. 93-49]

A machine is provided for the squaring and folding of one end of a rectangular ice cream carton. Means are included for the folding and interlocking of a pair of oppositely positioned flaps which incorporate a hook and slot, respectively. 32 figures. E.G.S.

GOSS, HAROLD J. Box-making machine. U. S. patent 2,541,414. Filed May 31, 1946. Issued Feb. 13, 1951. 21 claims. Assigned to Central National Bank of Cleveland. [Cl. 93-49]

A method and apparatus for the manufacture and erection of double-wall boxes are designed to permit a desired number of boxes to be delivered simultaneously and in sequence to a suitable conveyor which leads to filling and packaging machines. 8 figures. E.G.S.

HOLLAND, JACK W. Machine for laminating and reinforcing webs. U. S. patent 2,542,139. Filed May 25, 1949. Issued Feb. 20, 1951. 2 claims. [Cl. 154-1.7]

A method and machine are adapted for the simultaneous production of two two-ply laminated paper webs with transverse reinforcing filaments between the plies. 4 figures. E.G.S.

PIAZZE, THOMAS E. Carton handling machine. U. S. patent 2,541,607. Filed Sept. 27, 1946. Issued Feb. 13, 1951. 15 claims. Assigned to Shellmar Products Corporation. [Cl. 93-53]

A carton-feeding mechanism includes a reciprocrating carton support which has a relatively rapid rearward thrust and a relatively slow forward thrust, whereby large stacks of cartons can be handled conveniently. 10 figures. E.G.S.

STOKES, JOHN S. Boxmaking system. U. S. patent 2,542,099. Filed Jan. 16, 1946. Issued Feb. 20, 1951. 7 claims. Assigned to Stokes and Smith Company. [Cl. 93-54]

A boxmaking system is described in which mechanically joined duplex wrappers are delivered in succession to an assembly station, where they are brought to a standstill in predetermined relation to a guide, by means of which two box blanks may be properly registered on each half of a duplex wrapper. The box blanks are delivered within reach of the operator by means of a conveyor and are deposited upon a delivery shelf in side-by-side relation. Thus the operator can grasp a blank in each hand and simultaneously place them in registry on each half of the duplex wrapper. 6 figures. E.G.S.

TROTH, JOHN S., and BRIGHT, STANLEY, JR. Containers and methods of manufacturing them. Canadian patent 471,041. Filed Oct. 23, 1947. Issued Jan. 23, 1951. 9 claims. Assigned to Robert Gair Company, Inc.

An assembly of knife and scoring elements is adapted for the binding or fusing of laminated plastic material during a cutting or scoring operation. 8 figures. E.G.S.

VEYRET, LOUIS, and GEFFROY, GEORGES. Container folding machine. U. S. patent 2,542,379. Filed Jan. 20, 1948. Issued Feb. 20, 1951. 6 claims. Assigned to La Cellophane. [Cl. 93-49]

A method and apparatus are described for the formation of watertight, paper liner bags for rectangular, open-top cartons in flat, collapsed form suitable for shipment. 20 figures. E.G.S.

WOLFORD, WALTER L. Apparatus for applying bottle collars. U. S. patent 2,535,473. Filed Oct. 11, 1947. Issued Dec. 26, 1950. 7 claims. Assigned to Clorox Chemical Co. [Cl. 216-61]

An apparatus is adapted for the application of paper bottle collars to an entire case of bottles in a single operation. 13 figures. E.G.S.

ZINN, JULIUS A., JR. Method and apparatus for making laminated packaging blanks. U. S. patent 2,542,298. Filed Feb. 3, 1948. Issued Feb. 20, 1951. 14 claims. [Cl. 93-36.6]

An apparatus and method are provided for the forming of a sheet backing material (e.g., cardboard) and a sheet lining material (e.g., metal foil, waxed paper, or the like) into a laminated packaging blank which is adapted to be formed into a sealed container for foods or beverages. 17 figures. E.G.S.

MACHINERY—CREPING MACHINE

GRETTVE, KARL E. L. Apparatus for creping paper and other crepable foils. U. S. patent 2,535,734. Filed July 12, 1945. Issued Dec. 26, 1950. 3 claims. [Cl. 154-30]

The apparatus is similar to that described in Canadian patent 467,307; *cf.* B.I.P.C. 21: 135. E.G.S.

MACHINERY—DECORTICATING MACHINE

CHAPMAN, ROBERT S. Pressure expansion gun. U. S. patent 2,539,991. Filed Sept. 9, 1949. Issued Jan. 30, 1951. 4 claims. Assigned to Elmer R. Perkins. [Cl. 92-1]

A pressure-expansion gun is designed for the extraction of fiber from fiber-bearing plants. Means are provided for the even distribution of steam or high-pressure air to all parts of the load. A mechanism is included for closing an expansion valve at the bottom of a cylindrical vessel and for quickly opening the valve to permit the contents to expand from the vessel. 5 figures. E.G.S.

CHAPMAN, ROBERT S., and SIEBENHAAR, BYRON B. Expansive fiber separator. U. S. patent 2,539,990. Filed Nov. 14, 1946. Issued Jan. 30, 1951. 6 claims. [Cl. 92-1]

An expansive fiber separator is adapted for use in the expansion and extraction of fibers from yucca leaves, sisal plants, ramie stocks, and other fiber-bearing plants. A mechanism is provided for closing, locking, and releasing an expansion-valve door in a steel pressure vessel, through which the material is released to effect a disruption of the leaf structure and a release of the fiber. 13 figures. E.G.S.

MACHINERY—DRYERS

NEUBAUER, HERMAN E. Drying drum. U. S. patent 2,542,287. Filed Nov. 6, 1945. Issued Feb. 20, 1951. 3 claims. Assigned to Blaw-Knox Company. [Cl. 34-124]

A steam-heated drier drum incorporates a number of internal, continuous, annular rings or ribs which are formed integrally with, or are welded to, the inner peripheral surface of the wall and extend radially, but only partially, across the chamber. The ribs are disposed side by side at spaced intervals along the length of the drum and are peripherally continuous along the wall.

Each of the ribs also terminates along its inner edge in a lateral double flange which is parallel to the axis of rotation of the drum. The flanges, in conjunction with the ribs, provide a very rigid reinforcement for the wall of the drum and provide resistance to the deflection and distortion of the drum. 3 figures. E.G.S.

TREVISAN, BRUNO. Paper machine. U. S. patent 2,535,970. Filed Sept. 13, 1947. Issued Dec. 26, 1950. 7 claims. Assigned to Papierfabrik Balsthal A. G. [Cl. 34-119]

Hot water is used as the heating medium in the drier rolls of a paper machine. It is claimed that accurate temperature control is facilitated. 1 figure. E.G.S.

MACHINERY—FELTS

GEDDINGS, SAINT J. Felt for papermaking machines. U. S. patent 2,540,874. Filed May 25, 1949. Issued Feb. 6, 1951. 1 claim. [Cl. 139-383; changed to 139-411]

One face of a papermaking felt is formed entirely of a heat-resisting material (e.g., asbestos), and the opposite face is formed of highly absorbent material (e.g., cotton). 6 figures. E.G.S.

MACHINERY—PACKAGING MACHINERY

ALMGREN, AUGUST E., and JAKOB, JOHN P. Method of sealing bags. U. S. patent 2,539,390. Filed Dec. 17, 1947. Issued Jan. 30, 1951. 5 claims. Assigned to American Can Company. [Cl. 93-6]

A method is described for folding together and sealing marginal edge portions of an open end of a bag which is filled with articles such as cans or containers; the marginal edge portions are folded inwardly at the corners in a pleated fashion which results in a smooth corner construction. 8 figures. E.G.S.

ALMGREN, AUGUST E., and JAKOB, JOHN P. Sealing head mechanism for closing and sealing bags and containers. U. S. patent 2,539,389. Filed Dec. 17, 1947. Issued Jan. 30, 1951. 11 claims. Assigned to American Can Company. [Cl. 93-6]

A sealing head mechanism is adapted for the folding and sealing of filled paper bags. The marginal edge portions of a bag are folded in such a manner that corner pleats are formed. 11 figures. E.G.S.

BRYANS, HARRY C. Roll crimping machines. Canadian patent 471,159. Filed Dec. 22, 1949. Issued Jan. 30, 1951. 6 claims. Assigned to Canadian International Paper Company.

This is the same as U. S. patent 2,533,993; *cf.* B.I.P.C. 21: 364-5. E.G.S.

MACHINERY—PASTING MACHINE

HART, GEORGE T., and SEYMOUR, MALCOLM. Box forming machine. U. S. patent 2,535,413. Filed March 9, 1945. Issued Dec. 26, 1950. 2 claims. Assigned to United Shoe Machinery Corporation. [Cl. 93-49]

A semiautomatic box end-forming machine incorporates a pressing mechanism embodying electrodes which, when energized by a suitable source, set up

a high-frequency electrostatic field that passes through the end of the box to activate a thermoplastic adhesive during the pressing operation. 9 figures. E.G.S.

SHIELDS, ALBERT F. Taping machines. Canadian patent 471,403. Filed Nov. 22, 1946. Issued Feb. 6, 1951. 13 claims. Assigned to S & S Corrugated Paper Machinery Co., Inc.

This is the same as U. S. patent 2,467,275; *cf.* B.I.P.C. 20: 533-4. E.G.S.

WEEKS, NORMAN E. Method of adhesively securing valve sleeves to bags. U. S. patent 2,542,170. Filed Oct. 9, 1948. Issued Feb. 20, 1951. 2 claims. Assigned to Bemis Bro. Bag Company. [Cl. 154-116]

A paper valve sleeve is coated with a transverse stripe of thermoplastic adhesive which serves to unite the sleeve to a cloth bag. 8 figures. E.G.S.

MACHINERY—PULP-INSULATING MACHINE

EWALDSON, WALDEMAR C. Conductor guide in insulating machine. U. S. patent 2,543,525. Filed April 16, 1947. Issued Feb. 27, 1951. 3 claims. Assigned to Western Electric Company, Incorporated. [Cl. 92-55; changed to 92-40]

A pulp-insulating machine embodies a conductor guide which is readily variable with respect to a Fourdrinier wire to which pulp is applied to cover a number of parallel electrical conductors, and which is responsive to variations in the gage of the conductors. 5 figures. E.G.S.

MACHINERY—ROLL STANDS

SEEGER, EDWARD B. Mill roll stand. U. S. patent 2,535,815. Filed Oct. 15, 1947. Issued Dec. 26, 1950. 1 claim. Assigned to Samuel M. Langston Co. [Cl. 242-58]

A mill roll stand incorporates a shaft support which includes a sleeve of such length that the shaft may be supported from only one end and solely by this sleeve, during the endwise movement of the roll onto the shaft. The other shaft support is provided with a clamping device so that it may be released from the shaft and moved out of the way to permit the endwise movement of the roll onto the shaft. The stand is particularly adapted for use in conjunction with corrugating machinery and the like. 5 figures. E.G.S.

MACHINERY—SCREENS

GLASCO, MARK A. Paper stock screening apparatus. U. S. patent 2,540,517. Filed May 11, 1948. Issued Feb. 6, 1951. 3 claims. [Cl. 92-29; changed to 92-33]

A stock-screening apparatus is provided in which the paper stock undergoes two separate stages of purification; the first stage takes place in a primary chamber where the relatively large particles of foreign matter are separated by gravity, and the second stage occurs on the foraminous top or screen of a secondary chamber where the relatively small, light particles of foreign matter are separated by a vibrating or rocking action of the chamber and screen. 7 figures. E.G.S.

MACHINERY—THICKENERS

COGHILL, JAMES T. Apparatus for treating wood pulp and the like. Canadian patent 471,506. Filed Aug. 19, 1948. Issued Feb. 13, 1951. 32 claims. Assigned to Consolidated Machine Tool Corporation.

A combination pulper and thickener includes means for dewatering a 2-4% pulp slurry to a consistency of 10-35%. The equipment is adaptable for the treatment of repulped paper, as well as for bleaching or deinking operations. 17 figures. E.G.S.

MACHINERY—VALVES

PINE, PERRY S. Valve. U. S. patent 2,543,376. Filed Sept. 3, 1947. Issued Feb. 27, 1951. 2 claims. Assigned to Noble & Wood Machine Co. [Cl. 251-10]

A beater dump valve incorporates a cam linkage near the inside edge of the valve for tilting one edge of the valve to break the seal of the valve on its seat. 2 figures. E.G.S.

MATERIALS HANDLING

NIELSEN, NIELS M. Methods of treating and transporting wood pulp and the like. Canadian patent 471,131. Filed Dec. 27, 1945. Issued Jan. 30, 1951. 2 claims.

In the case where the pulp and paper mills are remote from one another, a pulp suspension with a consistency of 30-70% is transported from the pulp mill to the paper mill in tank cars or ships. E.G.S.

METERS AND RECORDERS

SCHIE, ARNE J., and STRATVEIT, NILS N. Methods and devices for regulating, recording and indicating respectively the degree of dryness of webs. Canadian patent 471,111. Filed Jan. 16, 1948. Issued Jan. 30, 1951. 11 claims.

A device for determining the moisture content of a moving paper web comprises a thermocouple for measuring the temperature difference between two fixed points on the web near the dry end of the drier. 3 figures. E.G.S.

PACKAGING

JONES, WILLIAM R. Board bundle. U. S. patent 2,535,422. Filed March 1, 1947. Issued Dec. 26, 1950. 2 claims. Assigned to The Celotex Corporation. [Cl. 206-60]

A bundle of 6-8 sheets of simulated brick siding is enclosed in a double-faced corrugated wrapper which is secured with staples. 3 figures. E.G.S.

PAPER—COATED

STERICKER, WILLIAM. Manufacture of silicate-coated papers. Canadian patent 471,539. Filed Oct. 14, 1947. Issued Feb. 13, 1951. 17 claims. Assigned to National Silicates Limited.

A process is provided for rendering low-cost paper and paperboard oil and grease resistant and for simultaneously bleaching the sheet material. A paper web from which the bulk of the water has been removed and which contains components normally subject to staining by alkali is coated with a 10-55° Bé. solution of a commercial sodium silicate and a colorless, oxidizing bleach-

ing agent (e.g., a water-soluble peroxide, hypochlorite, or perborate, or hydrogen peroxide). The web is dried without washing out the residues of the bleaching reaction. The product is suitable for the packaging of oily foods, cosmetics, and the like. E.G.S.

PAPER—PERMANENCE

STUDENY, JOHN, POLLARD, JOHN D., and LANDES, CHESTER G. Permanent paper and method of making same. U. S. patent 2,539,558. Filed Sept. 28, 1948. Issued Jan. 30, 1951. 5 claims. Assigned to American Cyanamid Company. [Cl. 117-154]

A paper (e.g., sulfite bond or safety-check base paper) is impregnated with a 1-5% aqueous solution of dicyandiamide or monomeric monoethylol dicyandiamide to retard its embrittlement and discoloration. E.G.S.

PAPER SIZING

ERSPAMER, AUGUST S. Paper size. U. S. patent 2,541,692. Filed Jan. 14, 1947. Issued Feb. 13, 1951. 10 claims. Assigned to P. H. Glatfelter Company. [Cl. 260-26]

A paper size composition comprises an aqueous alkaline suspension which contains about 12% by weight of a mixture of rosin and a copolymer of glycerol and maleic anhydride. The degree of polymerization of the copolymer is sufficiently low that its acid number is greater than 350. E.G.S.

PAPER SPECIALTIES

BANKS, MILLARD S. Water disintegratable soap package. U. S. patent 2,539,395. Filed June 12, 1946. Issued Jan. 30, 1951. 13 claims. [Cl. 252-93]

A single-use soap package consists of a quantity of soap flakes wrapped in a paper tube. A thin, light, readily disintegratable paper is preferred; cigarette paper, Japanese tissue, or light toilet paper is recommended because of the very rapid disintegration which occurs when such paper is wetted. 4 figures. E.G.S.

BARBIERI, CESARE. Double-wall paper container. U. S. patent 2,540,565. Filed Feb. 27, 1947. Issued Feb. 6, 1951. 3 claims. Assigned to Dixie Cup Company. [Cl. 229-5.5]

A double-wall, double-bottom paper cup is adapted to hold hot or cold liquids, or other substances, such as coffee, ice cream, cottage cheese, and the like. 4 figures. E.G.S.

GOTTESMAN, HERMAN. Cooking bag. U. S. patent 2,542,245. Filed March 23, 1946. Issued Feb. 20, 1951. 4 claims. [Cl. 229-62]

The walls of a bag which is adapted for the cooking of vegetables and other edible products are formed of vegetable parchment or other suitable material. The walls are secured together around the edges by heavy reinforcements, which comprise an outer folded kraft paper strip, an aluminum or other metal foil strip inside the cover strip, and a similar folded metal foil strip inside the parchment layers, which is reinforced by folded kraft strips. The aluminum foil may be provided with a heat-sealing coating which will fuse and firmly unite with the parchment under the application of heat. 4 figures. E.G.S.

HARMON, HOMER E. Cover for garment hangers. U. S. patent 2,539,621. Filed Dec. 17, 1948. Issued Jan. 30, 1951. 4 claims. Assigned to The Fleischer Mills, Inc. [Cl. 223-98]

A paper cover for a triangular wire garment hanger includes a closure or locking flap for positively securing the hanger within the cover. 5 figures. E.G.S.

HERMANSON, WILLIAM A. Rubberized abaca fiber paper. U. S. patent 2,541,763. Filed April 23, 1948. Issued Feb. 13, 1951. 5 claims. [Cl. 117-155]

A flexible, yieldable, nonstretchable sheet is prepared by the impregnation of a web of new abaca fibers with a liquid which comprises 50 parts of latex (40-50% solids), 45 parts of a solution of 5 grains of a dye (e.g., of a stilbene derivative, triazine, or modified umbelliferone) in 100 ml. of water. The dried sheet has a rubber- and mineral-solid retention of 165% of the base weight of the sheet before impregnation. E.G.S.

IBSCH, ERNEST A., JR. Laminated vessel. U. S. patent 2,542,413. Filed Feb. 11, 1947. Issued Feb. 20, 1951. 1 claim. [Cl. 65-15]

A dish or receptacle is formed with removable laminations of a relatively flexible material (e.g., paper, plastic sheets, or the like) which is rendered moistureproof so that succeeding laminations will not be damaged through the use of the outermost lamination. 5 figures. E.G.S.

MILLER, HARRY F., and FLOWERS, RALPH G. Fibrous dielectric compositions. U. S. patent 2,535,690. Filed Aug. 2, 1947. Issued Dec. 26, 1950. 8 claims. Assigned to General Electric Company. [Cl. 117-154]

A dielectric sheet material which is suitable for use in small capacitors comprises the fibrous reaction product of a kraft pulp with acrylonitrile in an aqueous sodium hydroxide solution; the fibrous material has a nitrogen content of 0.3-2.8%. Pentachlorodiphenyl or castor oil may be incorporated as a dielectric composition. 1 figure. E.G.S.

SENNÉ, EDGAR P. Filter unit for vacuum cleaners. U. S. patent 2,543,556. Filed May 15, 1948. Issued Feb. 27, 1951. 11 claims. [Cl. 183-73]

A prefolded filter-bag unit for use in vacuum cleaners comprises a collapsed paper filter bag which is enclosed in a cardboard cartridge; after the cartridge has been inserted in the vacuum cleaner, the bag is expanded by the pressure of the air from the cleaner. 11 figures. E.G.S.

STAUNTON, LEROY W., ATKINSON, RALPH L., and HOPKINS, EDWARD J. Umbrellas. Canadian patent 471,088. Filed April 23, 1946. Issued Jan. 23, 1951. 7 claims. Assigned to United Wallpaper, Inc.

A low-cost, emergency-use umbrella incorporates a number of flat ribs (formed, e.g., from chipboard, cardboard, plywood, or plastics) and a flexible, water-repellent, waxed-paper cover. 42 figures. E.G.S.

TOWNE, HAROLD G. Dispensing package of flexible articles of sheet material. U. S. patent 2,540,499. Filed Dec. 11, 1948. Is-

sued Feb. 6, 1951. 3 claims. Assigned to Dennison Manufacturing Company. [Cl. 206-56]

A paper envelope for the packaging of paper or cloth reinforcing rings is provided with a dispensing opening at one corner. 5 figures. E.G.S.

PLASTICS—PAPER-BASE

GREEN, LAWRENCE B. Methods and apparatus for forming plastic laminates. Canadian patent 471,549. Filed July 30, 1945. Issued Feb. 13, 1951. 34 claims. Assigned to Shellmar Products Corporation.

This is the same as U. S. patent 2,496,911; *cf.* B.I.P.C. 20: 540. E.G.S.

ROOFING FELTS

STAFFORD, ROBERT M. Fire retardant waterproof coating. U. S. patent 2,542,721. Filed Jan. 25, 1947. Issued Feb. 20, 1951. 2 claims. Assigned to Johns-Manville Corporation. [Cl. 106-15]

A fire-retardant, water-resistant coating for felted asbestos roofing sheets consists essentially of asphalt having a softening point of at least 170°F., and finely divided filler material (5-30% by weight of cellular perlite having a density of 3-12 lb./cu. ft.) distributed uniformly throughout the asphalt. E.G.S.

SETUP BOXES

GIBSON, FREDERIC H. Plug box. U. S. patent 2,540,480. Filed June 21, 1945. Issued Feb. 6, 1951. 1 claim. Assigned one half to Fred H. Mahler. [Cl. 282-29]

A heavy paperboard box is adapted for holding collated sheets of carbon and typewriter paper in position until removed for use. Wooden corner posts serve to maintain the various sheets in alignment within the box. 5 figures. E.G.S.

SHIPPING CONTAINERS

CASSIDY, JOHN H., and GRUNDEN, REED M. Container bottom structure. U. S. patent 2,540,712. Filed July 28, 1948. Issued Feb. 6, 1951. 3 claims. Assigned to The Hinde & Dauch Company. [Cl. 229-39]

The bottom of a collapsible paperboard container is so constructed as to hold the upright walls of the container square and to distribute effectively the loads imposed upon the bottom to the side walls. 5 figures. E.G.S.

KLONER, IRVING I. Carton for cushioned shipping and displaying fragile articles. U. S. patent 2,541,368. Filed Sept. 5, 1947. Issued Feb. 13, 1951. 13 claims. [Cl. 229-27]

A corrugated board container incorporates integral cushioning means for protecting a fragile article (e.g., a glass- or mirror-paneled vanity case) within the carton against shipping damage. 11 figures. E.G.S.

PROPS, GEORGE P. Carton. U. S. patent 2,540,595. Filed May 22, 1948. Issued Feb. 6, 1951. 1 claim. Assigned to Fort Wayne Corrugated Paper Company. [Cl. 229-23]

A carton for the shipment and display of apples, oranges, or other fruit

comprises a pair of nesting, self-supporting receptacles which have open ends; one of the ends of each receptacle is equipped with end flaps for closing the same. For the packing and shipping of perishable foods, the nesting halves of the box are provided with registering apertures to afford a circulation of air through the box, and other registering apertures to provide hand holds. 5 figures. E.G.S.

RICKUS, GEORGE M. Container for hats. U. S. patent 2,540,992. Filed Nov. 1, 1949. Issued Feb. 6, 1951. 6 claims. Assigned to Hat Corporation of America. [Cl. 206-8]

A cardboard shipping container for a number of hats is provided with hat supports and spacer members which are correlated in such a manner that the support is held in the box against rotation, and the hats on the support are held against movement by the co-operation of the adjacent support. 2 figures. E.G.S.

SCHNEIDER, JOHN D. Carton and easel for sheets. U. S. patent 2,542,949. Filed June 15, 1948. Issued Feb. 20, 1951. 6 claims. [Cl. 40-102]

A corrugated shipping carton is adapted for assembly as a display easel for show cards. 9 figures. E.G.S.

SHIPPING CONTAINERS—MULTIWALL BAGS

STRELLER, WOLFGANG O. Bag closure. U. S. patent 2,539,799. Filed April 14, 1948. Issued Jan. 30, 1951. 2 claims. Assigned to St. Regis Paper Company. [Cl. 229-62]

An end closure for a valve-type bag incorporates a sealing tape which overlaps the end of the bag; the tape is folded back upon itself along an intermediate portion thereof, on one or both sides of the bag, to form a pleat or pleats substantially parallel to the end of the bag. The closure is completed by means of staples, or preferably, by a sewn seam which passes through the pleated portions of the tape and the interposed bag walls. The closure is particularly applicable to multiwall bags for the packaging of cereals, flour, cement, and the like. 6 figures. E.G.S.

SULFITE WASTE LIQUOR

BOOTH, ROBERT B. Wettable and dispersible thiocarbanilide. Canadian patent 470,990. Filed Nov. 23, 1944. Issued Jan. 23, 1951. 7 claims. Assigned to American Cyanamid Company.

Thiocarbanilide is coated with a small amount of a sulfide promoter (e.g., a dithiophosphate, a xanthate, a water-soluble mercaptobenzothiazole, or the like) and a hydrophilic protective agent (e.g., sodium or calcium lignosulfonate) to render it suitable for use as a promoter in the froth flotation of sulfide ores. E.G.S.

BUCKMAN, ALFRED F., JR. Refining of vegetable wax powder. U. S. patent 2,540,978. Filed May 15, 1948. Issued Feb. 6, 1951. 10 claims. Assigned to S. C. Johnson & Son, Inc. [Cl. 209-173]

A process is described for the removal of known waxy matter from crude vegetable wax powder. As an example, 200 parts of crude carnauba wax powder which contains 15-18% of leafy matter or borra is charged into an

open vessel. With the aid of mechanical agitation, the powder is thoroughly wetted with a solution of 520 parts of water and 2.5 parts of sodium lignosulfonate. After the wax has been wetted, a liquid slurry is formed by the addition of 1560 parts of water. The slurry is allowed to remain quiescent in the vessel for about 1.5 hours. A thick wax layer forms on the surface of the vessel, and the borra separates and settles to the bottom of the vessel. The wax layer is removed and placed in a permeable basket centrifuge or filter press; this layer contains about 30% wax and 70% water. After centrifugation for 30 minutes, the wax cake has a moisture content of about 40%. The wax is then removed from the centrifuge, broken into small lumps, and air dried in open trays. The borra content of the resulting dried wax powder is reduced to about 3%. 1 figure. E.G.S.

MERSEREAU, EMORY P., JR. Back-sizing composition for floor coverings. U. S. patent 2,542,344. Filed March 11, 1947. Issued Feb. 20, 1951. 2 claims. Assigned to Alexander Smith & Sons Carpet Company. [Cl. 106-123]

A back-sizing composition for floor coverings (e.g., Axminster rugs) contains the following ingredients (weight basis): sulfite waste liquor solids, 28-50%; starch, 20-35%; mineral filler, 0-42%; and a plasticizing resin (m.p. below 70°C.), 8-23%. E.G.S.

SIMPSON, HERMAN N. Method of recovering chemicals from liquor produced by pulping of cellulosic materials. U. S. patent 2,542,060. Filed Jan. 2, 1945. Issued Feb. 20, 1951. 15 claims. [Cl. 23-48; changed to 23-179]

A method is described for the recovery of chemicals from calcium-base sulfite waste liquor. An upper treating zone at 500-800°C. and a lower communicating zone at 850-1500° are created in a furnace. The waste liquor, together with sufficient air for combustion, is atomized downwardly into the upper zone to cause the evaporation of the water in the liquor, the ignition of the lignin and other organic matter, and the reaction of calcium lignosulfonate and carbon to produce, along with other products, calcium sulfide and sulfur dioxide. Sufficient sulfur dioxide is introduced into the lower zone to complete the reaction with calcium sulfide to form calcium oxide and other products. Air is introduced in sufficient quantity to burn any residual sulfur to sulfur dioxide. 2 figures. E.G.S.

SULFUR DIOXIDE

HECKER, AUGUST. Process for the manufacture of sulfur dioxide. U. S. patent 2,539,579. Filed Sept. 24, 1946. Issued Jan. 30, 1951. 3 claims. Assigned to Ciba Limited. [Cl. 23-178; changed to 23-177]

Sulfur dioxide is produced by the reaction of gaseous sulfur trioxide with solid sulfur. Pure, gaseous sulfur trioxide from the distillation of oleum is charged into the bottom of a reaction vessel which contains lumps of sulfur at a temperature not exceeding the melting point of the latter, but above that at which sulfur trioxide condenses. Sulfur dioxide is formed continuously and is withdrawn at the top of the reaction vessel at a rate of about 160 kg./hr./cu. m. (10 lb./hr./cu. ft.) of reaction volume. 1 figure. E.G.S.

TALL OIL

DAVIS, GIFFORD D., and BARTH, EDWIN J. Sulfurized tall oil. Canadian patent 471,538. Filed March 23, 1944. Issued Feb. 13,

1951. 5 claims. Assigned to National Oil Products Company.

A high-pressure lubricant is produced by the reaction of the glyceryl esters of tall oil with elemental sulfur at 300-380°F. for 4-10 hours. The product has good lubricating properties, including oiliness, wetting power, tenacity, and extreme-pressure properties. E.G.S.

GIESEKE, ELMER W. Flotation of ores. Canadian patent 470,989. Filed July 21, 1944. Issued Jan. 23, 1951. 4 claims. Assigned to American Cyanamid Company.

Higher fatty acids, tall oil, their sodium, potassium, or ammonium soaps, or mixtures thereof, are used as promoters in the froth flotation of barite ores. 3 figures. E.G.S.

HERKENHOFF, EARL C. Pretreatment of iron ores. Canadian patent 471,142. Filed June 17, 1944. Issued Jan. 30, 1951. 7 claims. Assigned to American Cyanamid Company.

Tall oil, its sulfonated derivatives, or its sodium, potassium, or ammonium soaps are utilized as anionic promoters in the beneficiation of iron ores. 1 figure. E.G.S.

SPITZER, WILLIAM C., and RYAN, RUSSELL T. Process for improving the drying qualities of tall oil. U. S. patent 2,539,975. Filed Oct. 14, 1948. Issued Jan. 30, 1951. 11 claims. Assigned to The Sherwin-Williams Company. [Cl. 260-97.5]

A process for the manufacture of a varnish vehicle comprises the steps of heating an oil-like unsaturate (e.g., crude tall oil acids or their polyhydric alcohol esters) to 200-300°C. and vigorously blowing air through the mixture at such a rate that turbulent agitation is maintained, but that the resulting exothermic reaction is not allowed to increase the temperature above the stated temperature range. E.G.S.

WET STRENGTH

SCHENCK, WILLARD A. Method of making wet strength paper. U. S. patent 2,540,352. Filed Oct. 27, 1945. Issued Feb. 6, 1951. 8 claims. Assigned to Munising Paper Company. [Cl. 117-155]

This is similar to Canadian patent 459,141; *cf.* B.I.P.C. 20: 64. E.G.S.

WOOD—EXTRACTIVES

VAN BECKUM, WILLIAM G. Process for producing dehydroperillic acid. U. S. patent 2,541,127. Filed June 17, 1948. Issued Feb. 13, 1951. 6 claims. Assigned to Weyerhaeuser Timber Company. [Cl. 260-124]

A process is described for the recovery of dehydroperillic acid and lignin products from lignocellulosic material. As an example, Asplund western red-cedar fiber is extracted with a 0.6% aqueous sodium hydroxide solution at the boiling temperature of the solution and atmospheric pressure for one hour. The fiber is then separated from the solution and washed with water for subsequent use. The alkaline extract is fortified with sufficient caustic soda to restore the sodium hydroxide concentration to that of the original solution; the fortified solution is then employed in the extraction of additional raw wood fiber. Eight extractions of fiber are carried out in this manner; the

sodium hydroxide in the extracting solution is replenished after each extraction. The resulting alkaline extract of dehydroperillic acid and other materials removed from the fiber is neutralized with sulfuric acid, concentrated by evaporation to 12% of its original volume, cooled, and filtered. The filtrate is acidified to a pH of 5, thus precipitating dehydroperillic acid, together with another finely divided lignin product. This mixture is heated to 65°C. and allowed to cool slowly; most of the lignin product coagulates and settles within a few hours. The supernatant liquid contains a fine dispersion of lignin-product particles together with relatively large crystals of dehydroperillic acid; the latter are separated on a coarse filter and purified by washing with cold water. 1 figure. E.G.S.

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